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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

1498
XXXII

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The AIRCRAFT ENGINEER AND AIRSHIPS

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The King's Cup Race

ARGUMENTS about the regulations governing the air race for the Cup presented by H.M. the King are interminable. Should it be a pure speed race, should it be on handicap, or should it be flown to a formula? Should it be open to anybody, or should it be confined to amateurs? Should it consist of one lap of a long course, or of numerous laps of a short course? There is no end to the alternatives possible and, during the sixteen years the race has been in existence, nearly everything has been tried, and nearly everything has been found unsatisfactory.

On Friday and Saturday next, the race will be flown for the first Cup to be presented by H.M. King George VI. That being the case, the Royal Aero Club has, very properly, decided that this year's race shall cover as large a proportion as possible of the British Isles. For Coronation Year that decision was logical and indeed inevitable. When the race was first inaugurated, the intention was to give the greatest possible number of His Majesty's subjects an opportunity to see the machines, and that fundamental principle ought to be retained in the future, numerous experiments having in any case shown any other course to be futile.

With the fundamental idea of sending the machines around the British Isles no one will quarrel. When, however, it comes to details of the course for the Eliminating Contest and Final, there is plenty of room for improvement, and more than one competing pilot has described to *Flight* his opinion of the course in the inelegant but descriptive word "lousy."

Should the weather on the two days turn out to be thick, the northern parts of the course will teem with dangers from the Scottish hills. To avoid them entirely and still to have taken competitors as far north as Aberdeen would have been difficult, but by choosing different turning points and controls, at least some of the more difficult country could have been avoided.

However, it is not so much with the risks of the hilly country that we are concerned as with the quite unnecessary sea crossings. No competitor has expressed to *Flight* any objection to the 21½ miles of sea between Portpatrick and Donaghadee. For the Coronation Year King's Cup race it was obviously desirable to include the Newtownards and Dublin controls, and even the slowest machines will cover the distance in about ten minutes, so the period of risk is not very long. But why in the name of common sense add another 180 miles or so of sea crossing over the Wash, Firths of Forth and Tay, Morecambe Bay, Luce and Wigtown Bays and Severn Mouth? These crossings could have been almost entirely avoided by a different choice of controls and turning points. One competitor suggested quite seriously that the members of the Racing Committee of the Royal Aero Club should be made to fly around the course with the competing machines!

Unfair

Another feature of this year's regulations which has come in for severe criticism is the refusal of the Club to make the Eliminating Contest a handicap race. Time after time this has been suggested, but the suggestion has not been adopted. It is difficult to see the objections to it, while the fairness of the handicap basis is obvious. As it is, the fast machines need never fly "all out" to get into the fastest two-thirds in their class, while the slow machines will be compelled to run their engines hard if they are to have any chance at all of getting into the Final.

Although it does not necessarily follow that the machines in Class A (up to 150 b.h.p.) are slower than those in Class B (machines of more than 150 b.h.p.) it will generally be so. The entry list shows that there are 17 machines in Class A and 14 in Class B, so that more than one half of the competing machines are unfairly treated.

Two desirable objects would be attained by racing the Eliminating Contest on a handicap basis; the chances of all competitors would be equal (assuming correct handicapping), and from the spectators' point of view there would be more interest in following the race at the different controls, as they would be able to follow the closing-up of the late starters on those in front, especially if race numbers were allocated in accordance with handicap allowances instead of the present meaningless numbering, which merely shows that Lord

Wakefield entered the first machine and Mr. W. H. Moss was the last to enter before the list closed. After all, it does not take many minutes to paint racing numbers on a machine.

If as seems possible, the Club's reason for not wishing to make the Eliminating Contest a handicap is that it is desired to encourage the entry of fast machines and discourage the entry of slow, that could have been done by raising by the necessary number of m.p.h. the minimum handicap speed of 130 m.p.h.

Nevertheless, and in spite of these difficulties and shortcomings, we can rely on the pilots and their navigators making a thoroughly clean, sporting and hard-fought race of it.

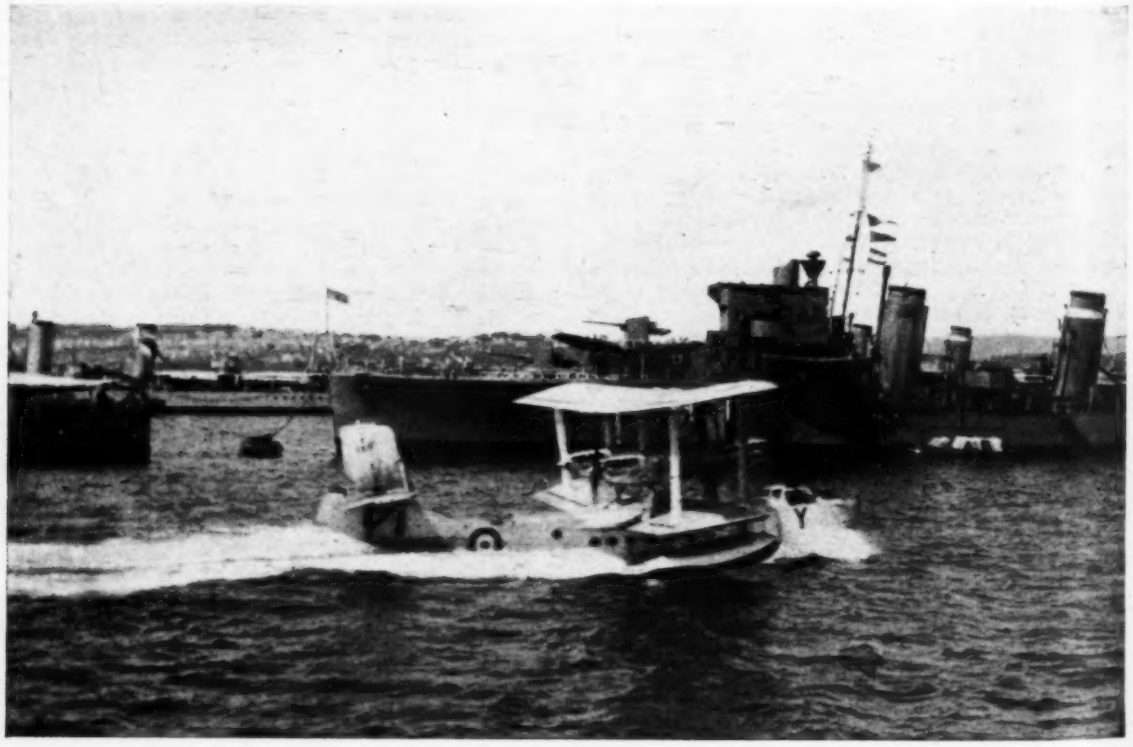
A Revolution?

THE middle-aged among us can remember acutely the low estimation in which the aeroplane was held among serious thinkers less than twenty years ago. To the serious, hard-headed men of affairs its devotees seemed little better than cranks. They had an interesting toy to play with, admittedly, but as for its entering into the business of the world, the serious man had something better to think about.

To show how far opinions have altered since then, one may study a prophecy uttered in a letter to the *Daily Telegraph* by the eminent Harley Street physician, Dr. Harry Campbell. Dr. Campbell's publications have been numerous, among them being *Man's Mental Evolution Past and Present*, and several books on nervous disorders. In the correspondence columns of our contemporary he was discussing the country's declining birth-rate, and he ended with the prophecy: "Two factors have within recent years been working a revolution: the falling birth-rate and the aeroplane. They are destined to exercise an immense influence on man's future."

There could hardly be a greater compliment to the importance of the once-despised aeroplane; but one is left wondering whether this medical authority considers the aeroplane a beneficent or a maleficent influence. As a writer on nervous disorders, his thoughts may have turned to its effect on the modern nervous system, but he could hardly have been thinking of the people who find their nerves upset by the noise of aircraft, for modern man has shown himself very adaptable where noises are concerned, and city dwellers have grown used to many more discordant noises. All devices which speed up the tempo of life and diminish the tax on physical exertion are apt to impose an increased strain on the nervous system, and the aeroplane comes into that category, but in many ways the aeroplane is less nerve-wracking than the telephone. The deadly results of the aeroplane in war need no emphasis, for they are evident in Spain and Shanghai; but would such tragedies justify the Doctor's words? They are merely another use of the old discovery of explosives. The revolution in war began when Roger Bacon discovered gunpowder, and the consequences of that discovery have been developing and multiplying ever since. As *Flight* has said over and over again, the bomber aeroplane is only a long-range gun.

One is rather inclined to think that the peaceful and beneficent influences of the aeroplane must be meant, the drawing closer together of people who live far apart, and the taking of medical and other aid to sufferers in the wilder parts of the earth. Life is now a different proposition from what it used to be in Canada's Frozen North and in the "Out-back" of Australia. People there need no longer die for want of a doctor's attention. In such ways the aeroplane is certainly working a welcome revolution.



SALT IN THE AIR: A Short Singapore III (four Rolls-Royce Kestrels) touches down alongside destroyers in Portland Harbour. The Singapore is probably the largest military flying boat in service in the world

The Outlook

A Running Commentary on Air Topics

The Cockpit

LONG before the German invasion of 1914, Belgium was called the Cockpit of Europe. Numberless battlefields within her borders told of wars between foreign nations with which Belgium would gladly have had nothing to do, had that been possible. Now Shanghai seems to be in a similar position. The ground is part of China, but on it has grown up an international settlement concerned primarily with commerce, and therefore anxious to have nothing to do with wars, alarums, or excursions. It is practically a neutral city, yet in it and over it the Chinese and Japanese forces are waging an intense and most destructive battle.

Were the operations only naval and military the precautions which the Powers interested in Shanghai have taken might well have saved the inhabitants from suffering much damage or loss, but the use of aircraft has upset all their calculations. The bombers of both sides fly over the city and drop their bombs. Doubtless these bombs were aimed at the forces of the other side, but bad shots have been frequent, and horrible carnage has been caused in the shopping quarters of what ought to be a peaceful city.

It is difficult to suggest a remedy. In the Great War the neutral States, Holland, for example, used to fire at belligerent aircraft which violated their neutrality by flying over their territory. Nothing of the sort is being done in Shanghai, and, as Japan is one of the nations which shares in the international settlement, it is not easy to see whether anything of the sort could be done. The city is suffering the results of what is in practice an air attack without being able to put up any sort of air defence. Whether the neutral Powers will be able to put a stop to this state of affairs remains to be seen, but something certainly ought to be done, and done quickly.

L'Effet de Cazeaux

ALMOST disturbing bugbear which confronted armament technicians as the speed of military aircraft rose above 200 m.p.h.—the problem of training free guns—has been routed by the introduction of some ingenious power-driven gun turrets as typified by the Nash and Thompson models specified for some of the latest British machines. But life is far from easy for the ballisticians, who are now confronted with what threatens to become an even more formidable obstacle—the deflection of bullets fired at an angle to the line of flight.

On the Continent (armament experiments conducted in this country are rarely publicised) the problem came into prominence during firing trials from the French *multi-place de combat* machines at Cazeaux, the proving ground of French aircraft armament. These aircraft were advertised as having an exceptionally complete field of fire due to the careful distribution of their heavy armament, but it was discovered that, although some most impressive arcs of fire were obtainable on paper, the deflection of bullets fired broadside detracted very seriously from their fighting value.

The logical step to take against this phenomenon is to increase the muzzle velocity of the bullets. This could be achieved by lengthening the gun barrel or increasing the propulsive charge, both of which measures have obvious limitations when applied to aircraft armament.

The situation is even more serious when considered in relation to "cannons" of comparatively large bore and low muzzle velocity. Some idea of the problems involved may be gathered from the following data supplied by the American Armament Corporation, which concern has been endeavouring to develop and popularise aircraft guns of 37 mm. calibre. It was found that in order to obtain a muzzle velocity of 2,700ft./sec. (that of the standard gun of 20 calibres length is given as 1,250ft./sec.) it was necessary to increase the length to 50 calibres with a consequent increase in the size and weight of all parts. As compared with the 20-calibre gun, the revised weapon would be over twice as long, three or four times heavier, have double the recoil force and will use rather heavier ammunition.

The large orders which have been placed for power-driven turrets in this country might indicate that *l'effet de Cazeaux* might not be so serious where small-bore, high-velocity guns are concerned, as is extensively believed, but, whatever the true facts, it seems that deflection of bullets and shells may be a prominent factor in determining the ultimate value of multi-seater fighters with free armament.

Orders for Naval Aircraft

SINCE the decision was come to that the Admiralty should have complete control of the Fleet Air Arm, extensive orders for ship-borne aircraft have been placed by the Admiralty. As some people are often ready to use a false argument and to conclude, in the old Latin phrase, *post hoc, ergo propter hoc,* which may be freely translated "it followed, therefore it was the result," it may be as well to stress the point that the recent Admiralty orders have nothing to do with the change of organisation which is shortly to come into effect. The Admiralty has always been free to order what aircraft it required for the Fleet Air Arm, and it has paid for them by an appropriation-in-aid.

The increased orders are due to the fact that the aircraft-carrier *Ark Royal* is to be completed, if all goes well, early next summer, and aircraft must be got ready in time to stock her hangars without delay. At the same time, the Admiralty continues to equip new cruisers and capital ships with catapults, and for them, likewise, aircraft must be ordered. Replacement, too, must not be disregarded.

Incidentally, all the Admiralty orders for aircraft still go through the Air Ministry, and there was nothing in the Prime Minister's statement last month when he announced the change in control of the Fleet Air Arm which leads one to suppose that that system will be altered. In fact, it is a good system, and to change it would be to ask for unnecessary trouble.

Ignored—Usefully

IT is doubtful if any series of flights have so impressed the public with the essential "ordinariness" and consistency of air transport as those which have been made, week by week, across the North Atlantic during this summer.

For the first flights the Short and the Sikorsky and their crews obtained all the attention which they so richly deserved—and that was a good thing. Now the flights receive practically no attention at all—which is an equally good thing in a different way, since the psychological effect of lack of newspaper attention should be that the public will come to believe that these crossings are almost as commonplace as the passages of the *Queen Mary*. Perhaps this good effect will not be immediately noticeable, but it is there, as any psychologist will tell us.

DIARY OF FORTHCOMING EVENTS—PAGE 263

THE WAR

Impressions and Confessions After Practice Flights over the King's Cup Route : Landmarks, Compass Courses and Weather Problems

By this time the majority of the competitors and sundry other interested persons will have made a tour of the King's Cup course and should have discovered the worst. And the worst can be fairly bad when the weather behaves itself no better than it has done during the past week or two, since the course crosses areas which appear to have their own weather systems—almost unpredictable, save by local talent. It would be a good thing, perhaps, if every member of the R.Ae.C. Racing Committee was compelled to travel as a passenger round any suggested course with some really daring pilot.

However, to be more cheerful, a large number of entrants appear to be pleased with the idea of hurtling at zero altitude into the unknown, and the course will at least weed the timid out of the final, though people with faster machines will have a little more time in hand with which to circumnavigate the Grampians and suchlike—therein lies much of the unfairness of elimination on a basis of pure speed. The weather *may* even be good.

With only three days in which to get round as much of the course as possible in a 105-m.p.h. machine, and no prize at the end of it, I confess to having been partially defeated last week. However, we (that is, myself and our chief photographer) managed to cover about two-thirds of the whole distance, and our impressions may be useful to those competitors who have not been able to spare the time to go and look, and interesting to readers who have had no reason to do battle with mountain ranges and the tall obstructions littered about the manufacturing areas of the North.

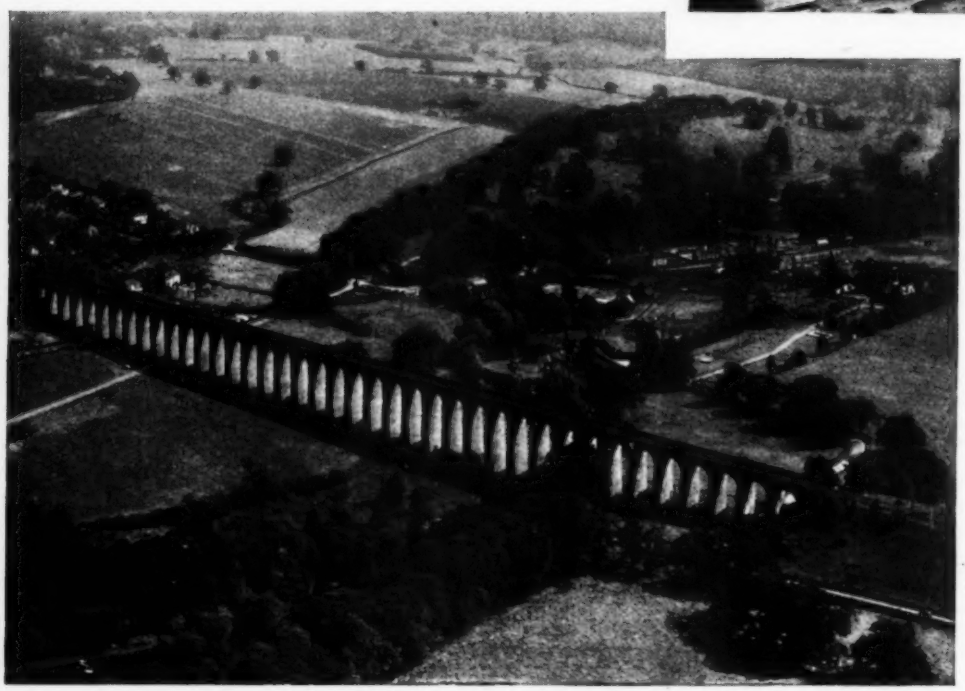
A *Foretaste*

Our very first day provided difficulties which were typical of the kind of things which are to be expected. The good Met. Office said that there was fog over the coasts and parts of the Midlands and South, but promised that this would lift and finally disappear later on. The experts were perfectly right, but the fog remained as very low cloud for a longer period than the forecast suggested. We simply had to slow up on our way north because we were moving faster than the improvement—yet we were travelling sedately in a London Club Hornet Moth and not in a T.K.4, and had waited until midday in order to give the weather plenty of warning.

When we left Hatfield the sky was cloudless, but visibility was reduced to two or three miles by haze. At no time was it better, and farther north, particularly in the Tyne and Tees areas, it was reduced to 1,000 yards or less under a ten-tenths ceiling of varying height.

If thick weather is experienced on the morning of September 10 competitors will have at least two superior landmarks—Welwyn viaduct and the Hertford-Hitchin line—to save themselves the humiliation of being a couple of miles out at Fen Ditton after crossing that surprisingly featureless piece of high ground lying between Baldock on the left and Buntingford on the right. This does not look so nearly featureless on the map; all the villages, however, are similar. By comparison, the apparently featureless Fen area is delightfully provided, the best and most useful landmark lying just twenty miles beyond Fen Ditton. Here is the unmistakable fresh green and dead straight ribbon, where the Old and New Bedford Rivers and the Delph River cut the Fens. The track crosses this belt just beyond the bridge of the March-Ely line, which is also crossing it at 45 deg. towards the west.

Thereafter there will be nothing to worry about until the Wash is reached,



(Above)
The beginning and the end: Hatfield aerodrome, which is now one of the largest and best-surfaced in the country. At the end of the final the competitors come in directly over the wireless masts, which have been emphasised in this picture.

(Left)
The first outstanding landmark on the first leg of the eliminating course—Welwyn Viaduct, which is just over four miles from Hatfield. In this and the other photographs illustrating the article the view taken is that seen by the competitor. (*Flight* photographs.)

VAROUND

After ...loratory Trip Over Most of the ...dmarks Competitors Will See Them : The Prob...

H. A. TAYLOR

Eighteen miles beyond Fen Ditton a belt of bright green grass formed by the Bedford and Delph rivers is crossed just beyond the point where it is bridged by a railway. The intersection is unmistakable. (*Flight* photograph.)

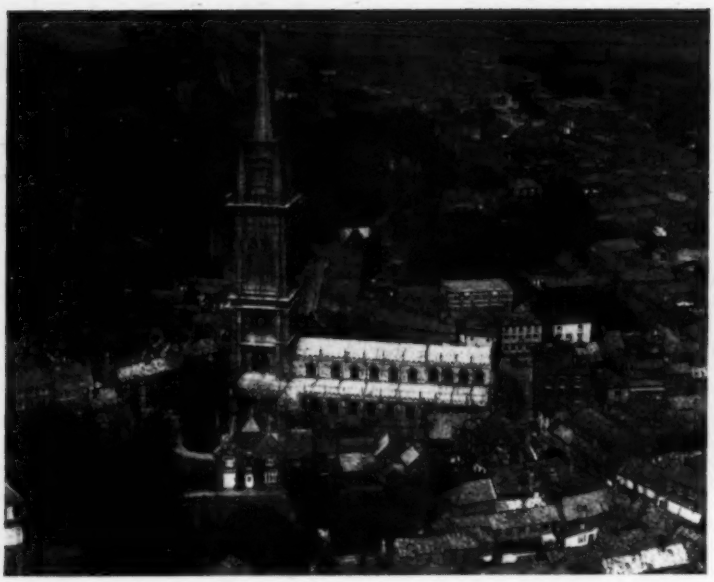
them, and they are high and spiky. A little deviation to the east will be advisable for safety in heavy rain or poor visibility. Perhaps they formed one reason for the change of the turning point at Skegness. Louth, at the end of a straight railway line bearing away about 5 deg. to the north of the track, is the course-checking mark on this leg, with Read's Island, south of Brough, as the Humber mark.

It was here that we overtook the weather, and the rest of the run to York was made at less than 1,000ft. in visibility of a mile or so. York has an excellent white-painted gasholder which should, if on course, be *just* not collided with. The aerodrome is not too easy to see, but can hardly be missed since it is only a couple of miles or so on the other side of the city centre. Incidentally, it has been ordained that the turning-point crosses shall lie, where possible, immediately to the north of the circle or aerodrome centre in each case.

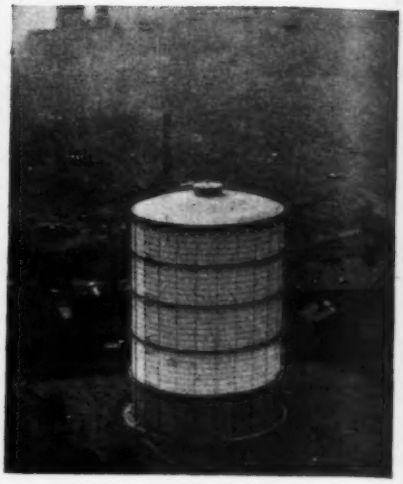
three miles to the right of the Nene estuary lighthouses. I was flying at 2,000ft., the visible world was reduced to a meagre patch of mud or water immediately below, and my northerly compass flying on the turn indicator was somewhat zig-zag owing to over-correction. Consequently, though we hit Skegness pier right in its centre, I never saw the Roaring Middle lightship. This, name and everything, should be seen when half-way across and about three-quarters of a mile to the right.

Although, on the next course competitors should leave the Skegness wireless masts (or whatever they are) on their right, there are a large number of

Skegness pier, the second turning point. This should be rather more highly populated to-morrow morning, but it will look much the same. (*Flight* photograph.)



Louth, which lies almost directly on the track of the third leg, and is twenty miles from Skegness pier. (*Flight* photograph.)



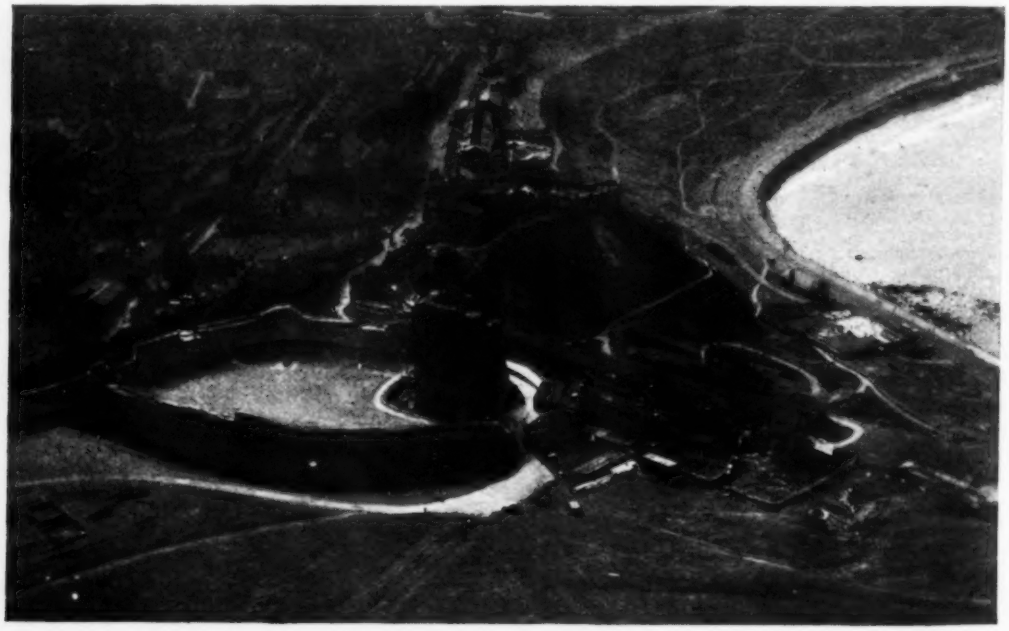
By way of a change, York's gasholder has been painted white and stands out very well in conditions of poor visibility. Competitors who see it within half a mile on their right are heading straight for the airport. (*Flight* photograph.)

Enquiries elicited the unwelcome information that Leeming, to the north-west, and Tyneside were still very much QBI, with clouds at 150-500ft. and visibility of less than 1,000 yards. We had lunch. In due course an improvement was reported (but the King's Cup waits for no man) and we set off for Scarborough, with the Derwent and the equally winding line to Scarborough providing unmistakable checks. There is really nothing to be said about Scarborough Castle and Whitby Abbey. There they are, and if anyone rounds the Grand Hotel at Scarborough or the Goods Station at Whitby then visibility must indeed be poor.

Timidly enough, I chose to go round the coastline and not to make a forty-mile sea-crossing with at least six miles to swim in case of trouble, but the track hits the coast again just beyond Seaham Harbour, which is quite a small place with the outer quays arranged conically in plan view and cannot possibly be mistaken for Sunderland. If there is any doubt, the real course should, in any case, take the machine right over Usworth aerodrome, which may or may not be seen amidst the yellow smoke pall which usually hangs over the district. Nothing but accurate flying or the Newcastle-Otterburn road will lead one to Woolsington, and the abounding mineral lines cannot be distinguished from main lines.

Scotland Impossible

Here, with reports of heavy rain and very low cloud at Edinburgh (the 2,000ft. Cheviots between), of a 150ft. ceiling at Dyce, Aberdeen, and little hope of improvement within twenty-four hours, we cheated to the extent of jumping the Pennines to Carlisle while the going was fairly good. The clouds stayed at 1,500ft. and there is an excellent tunnel-less railway line, but the promised storm arrived and the sky came down just as the machine was taxied up to the hangar. Further progress would have been mildly suicidal. However,



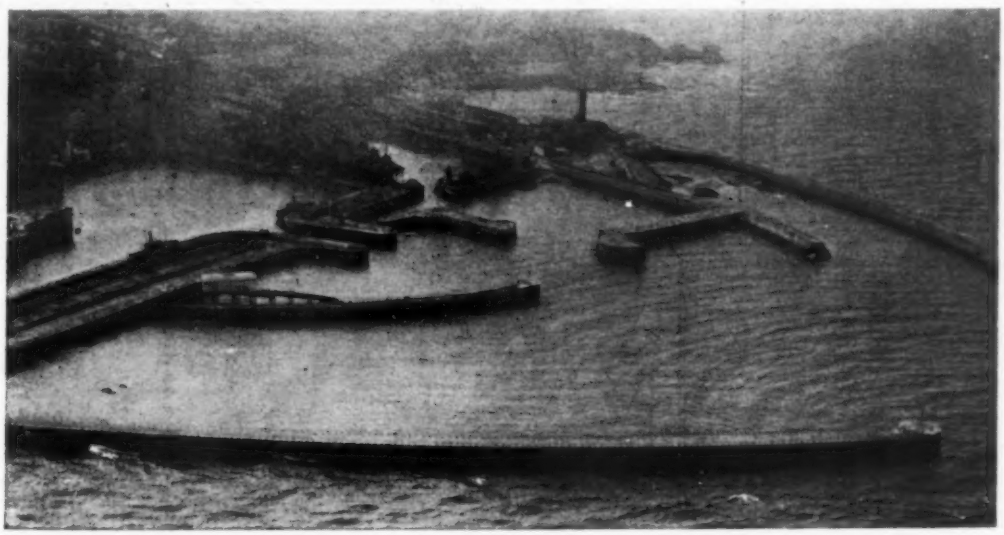
Scarborough Castle as it will be seen by the pilot as he comes out of his ninety-degree turn towards Whitby. (*Flight* photograph.)

Whitby Abbey : An unmistakable landmark on the highest piece of ground in the immediate area. (*Flight* photograph.) **(Right) Where the coast is crossed again after the Tay—Arbroath on the Forfar coast.** (*Aerofilms.*)

with the help of a specially marked A.A. map it may be interesting to visualise the more useful landmarks over the rest of the eliminating course.

On the Woolsington-Tranent leg, for instance, a railway line is crossed ten miles after departure and a second one after another five miles; here there is a useful intersection of railway, road and lakes. The ground is already rising and is due to reach 1,400ft. over Rothbury Forest, and, fifteen miles farther on, a matter of 2,000ft. in the Cheviots proper. Beyond the Tweed Valley the ground rises again to 1,500ft. over the Lammermuir Hills. In order to avoid them it will be necessary to fly right round by St. Abb's Head, adding about twenty miles to the distance. From Tranent there is ten miles of Forth, after which the Fife coast should be hit at St. Monans, three miles to the north-east of Saucher Point lighthouse. Beyond the Tay, Montrose and its basin form, of course, a quite unmistakable landmark.

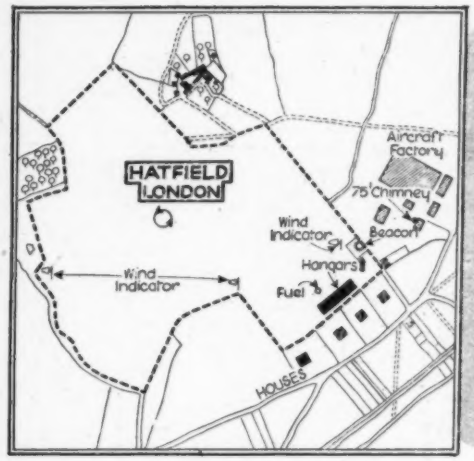
The next leg is likely to provide the toughest flying of the entire two days, and the pilots' only consolation is that, if the worst comes to the worst, it will be possible to go round the Grampians without losing too much time, while if the clouds come down when they are being crossed it should be easy to slip down a valley on the south-east slopes to the low ground. As far as the Ochill Hills are concerned one can go down Strath Allan and around to Renfrew via Stirling and Denny. All of which will add a good many miles to the journey. Again, south of Renfrew, the Castle Semple Pass is not too far off the course and after that it is possible to use the coastline to Loch Ryan, cutting across the northern end of The Rinns to Portpatrick. Land, in the shape of Mew and Copeland Islands, is passed a mile or two to the right before hitting Donaghadee and Newtownards. The Irish hazards consist only of the Mourne Mountains and twenty-eight miles of

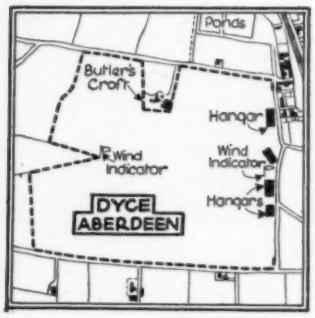


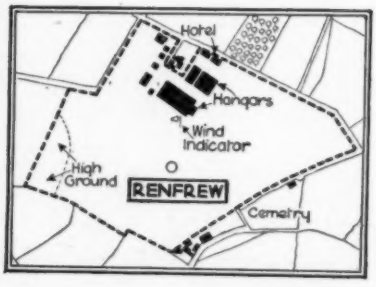
Seaham Harbour, an earlier landfall, as it will be seen by the competitor after the long sea-crossing past Middlesbrough. (*Flight* photograph.)

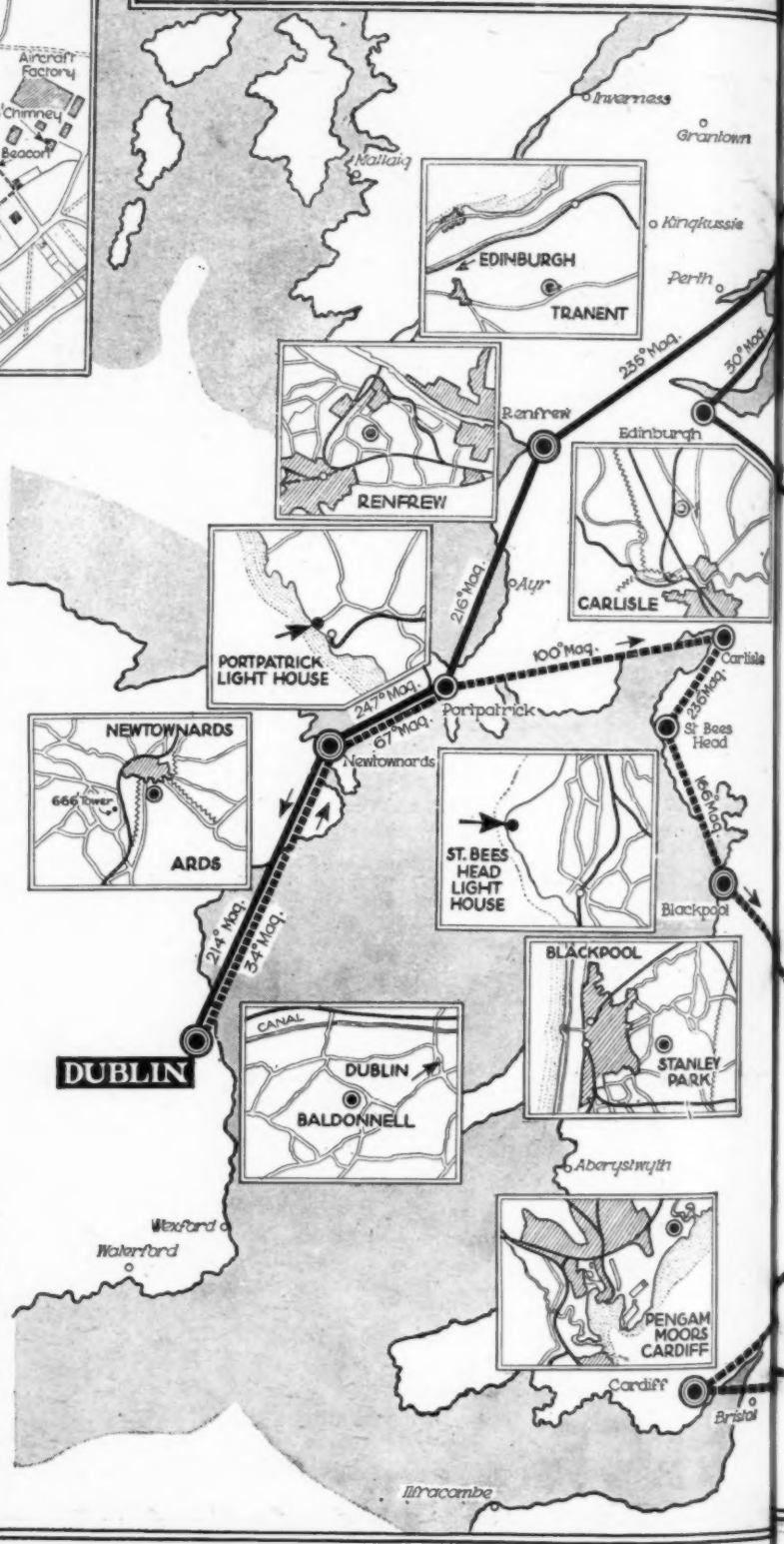
THE COURS

The Position of the Turning Po









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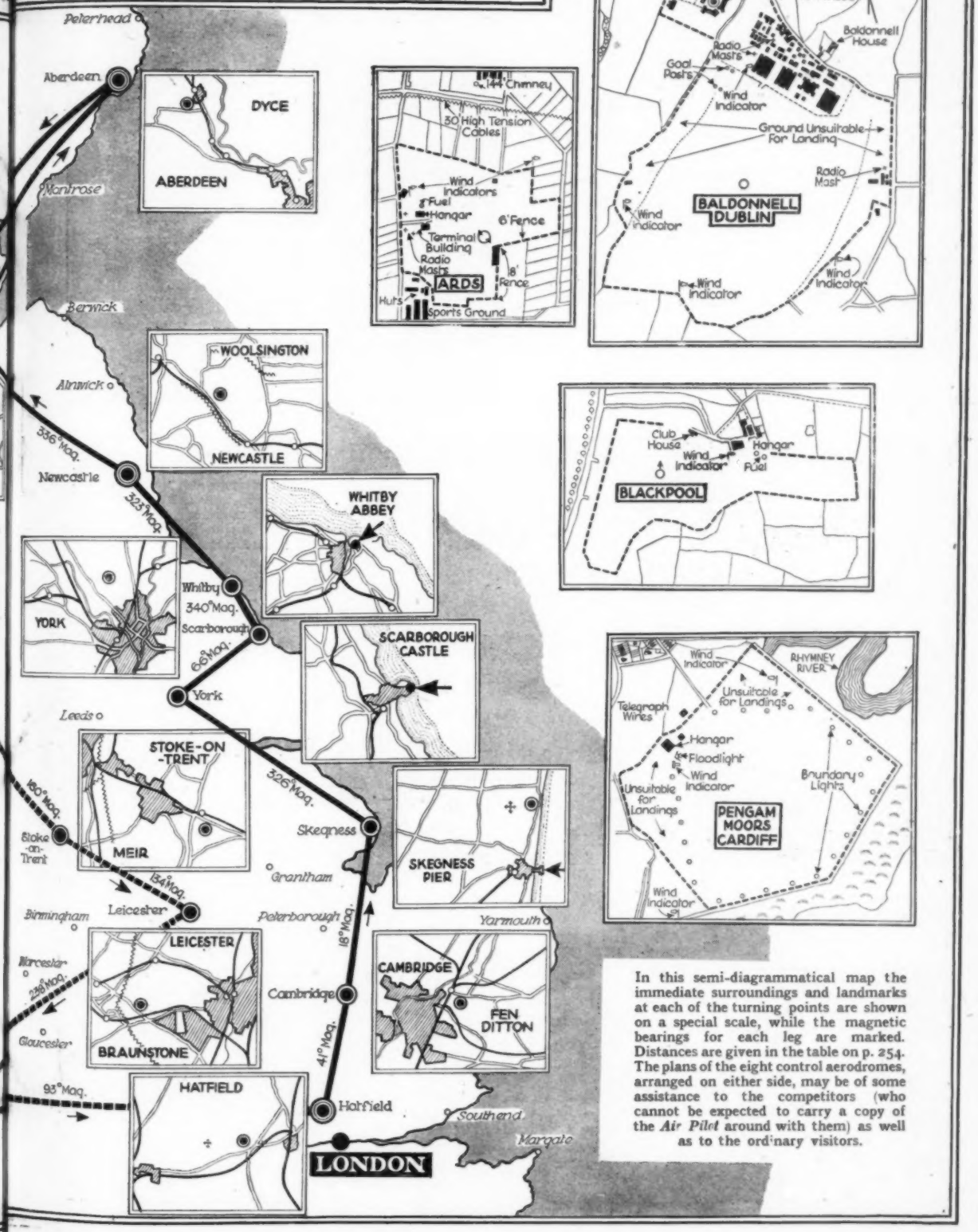


In this semi-diagrammatical map the immediate surroundings and landmarks at each of the turning points are shown on a special scale, while the magnetic bearings for each leg are marked. Distances are given in the table on p. 254. The plans of the eight control aerodromes, arranged on either side, may be of some assistance to the competitors (who cannot be expected to carry a copy of the *Air Pilot* around with them) as well as to the ordinary visitors.

COURSE for the ELIMINATING CONTEST, September 10.

Point.	Nature of Point.	Distance between Points. (miles).	Distance from Start (miles).
HATFIELD (Hatfield Aerodrome) ...	S.	00.00	00.00
CAMBRIDGE (Fen Ditton Aerodrome)	T.	35.15	35.15
SKEGNESS (Seaward end of Pier) ...	T.	65.19	100.34
YORK (York Aerodrome)	T.	83.31	183.65
SCARBOROUGH (Castle)	T.	35.76	219.41
WHITBY (Whitby Abbey)	T.	16.34	235.75
NEWCASTLE (Woolsington Aerodrome)	C.	57.66	293.41
EDINBURGH (MacMerry Aerodrome)	T.	78.66	372.07
ABERDEEN (Dyce Aerodrome) ...	C.	91.01	463.08
GLASGOW (Renfrew Aerodrome) ...	C.	124.79	587.87
PORTPATRICK (Coastguard Station)...	T.	76.18	664.05
NEWTOWNARDS (Ards Aerodrome) ...	C.	29.27	693.32
DUBLIN (Baldonnell Aerodrome) ...	F.	93.28	786.60

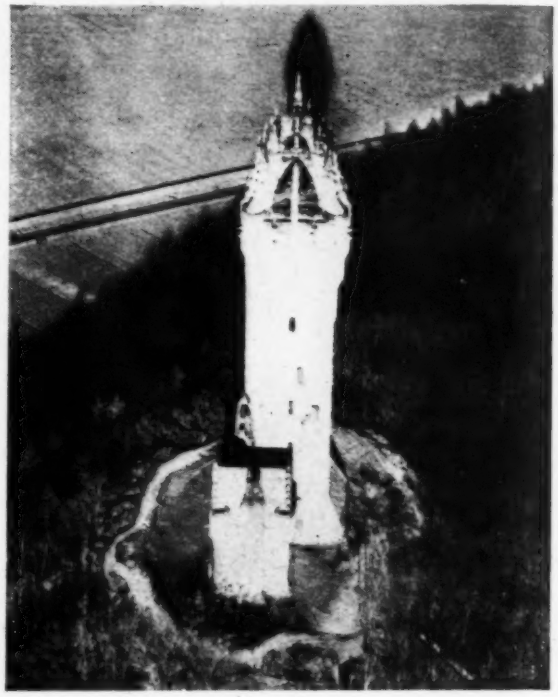
TOTAL : 786.60 Statute Miles.

COURSE for the FINAL, September 11.

Point.	Nature of Point.	Distance between Points. (miles).	Distance from Start (miles).
DUBLIN (Baldonnell Aerodrome) ...	S.	00.00	00.00
NEWTOWNARDS (Ards Aerodrome) ...	C.	93.28	93.28
PORTPATRICK (Coastguard Station)...	T.	29.27	122.55
CARLISLE (Carlisle Aerodrome) ...	T.	86.96	209.51
ST. BEES HEAD (Lighthouse) ...	T.	39.90	249.41
BLACKPOOL (Stanley Park Aerodrome)	C.	53.55	302.96
STOKE-ON-TRENT (Meir Aerodrome)	T.	69.69	372.65
LEICESTER (Braunstone Aerodrome)	T.	43.66	416.31
CARDIFF (Pengam Moors Aerodrome)	C.	113.82	530.13
HATFIELD (Hatfield Aerodrome) ...	F.	125.89	656.02

TOTAL : 656.02 Statute Miles.

S. = Start ; T. = Turning point ; C. = Control ; F. = Finish.



Twenty-eight miles before Renfrew, the Wallace Monument stands on a hill north of Stirling and is likely to be a useful landmark. On the left is Stranraer as it will appear to the pilot after crossing Loch Ryan on the way to Portpatrick, which is five miles farther on. (*Aerofilms.*)

open sea each way. It should be impossible to lose oneself either on this or on the Portpatrick-Carlisle leg during the final.

Contrary to the impressions of a number of people, Carlisle, though next door to the Lake District, is, in fact, surrounded by level country for quite a few miles, and the airport itself is only 100ft. above sea level. After obtaining a half-hearted weather report from Blackpool and a doubtful general forecast, we set off for St. Bees Head. In fact, it was possible to hold a direct track, though the cloud base was within 500ft. of

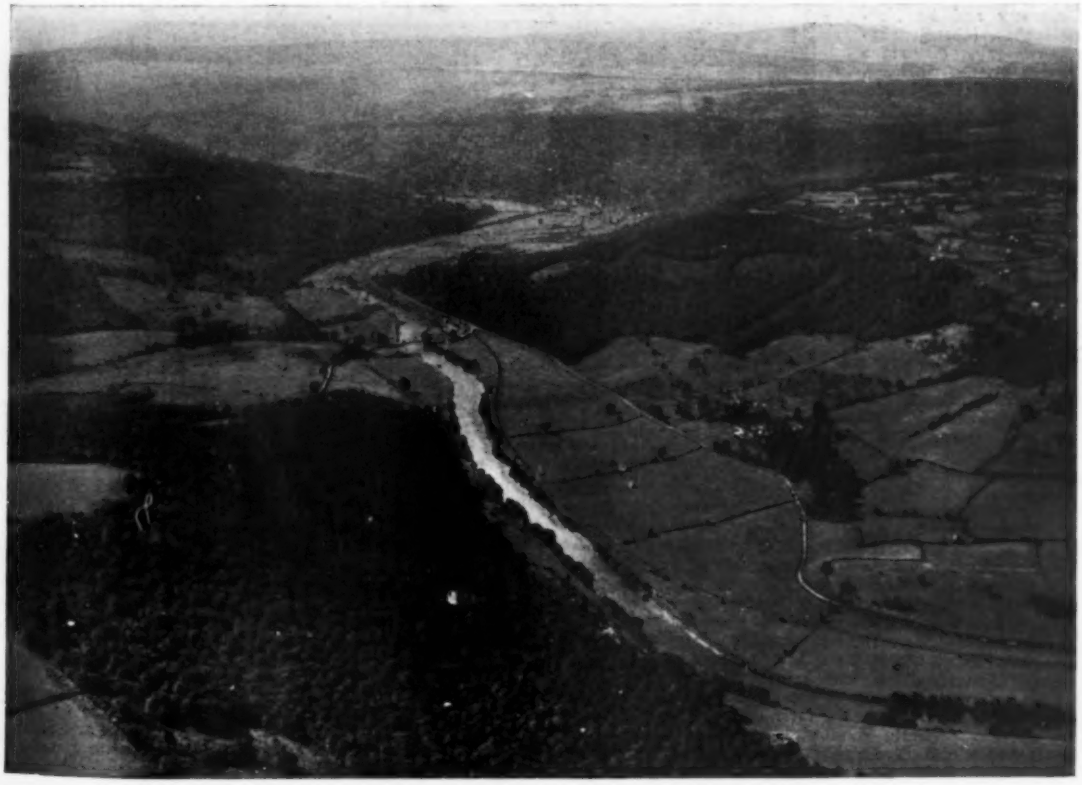
It is not often that a town is as distinctive as Wigtown (left) when viewed from the air. Above is the dark mass of St. Bees with its lighthouse as a very insignificant affair on the "roof." There is a coastguard station half a mile beyond. (*Flight* photograph.)

Well known as a Warwickshire motoring focus, Henley-in-Arden has a distinctly laid-out main street. The branch railway seen in the foreground is, for some reason, not marked on the more modern Ordnance Survey maps. (*Flight* photograph.)

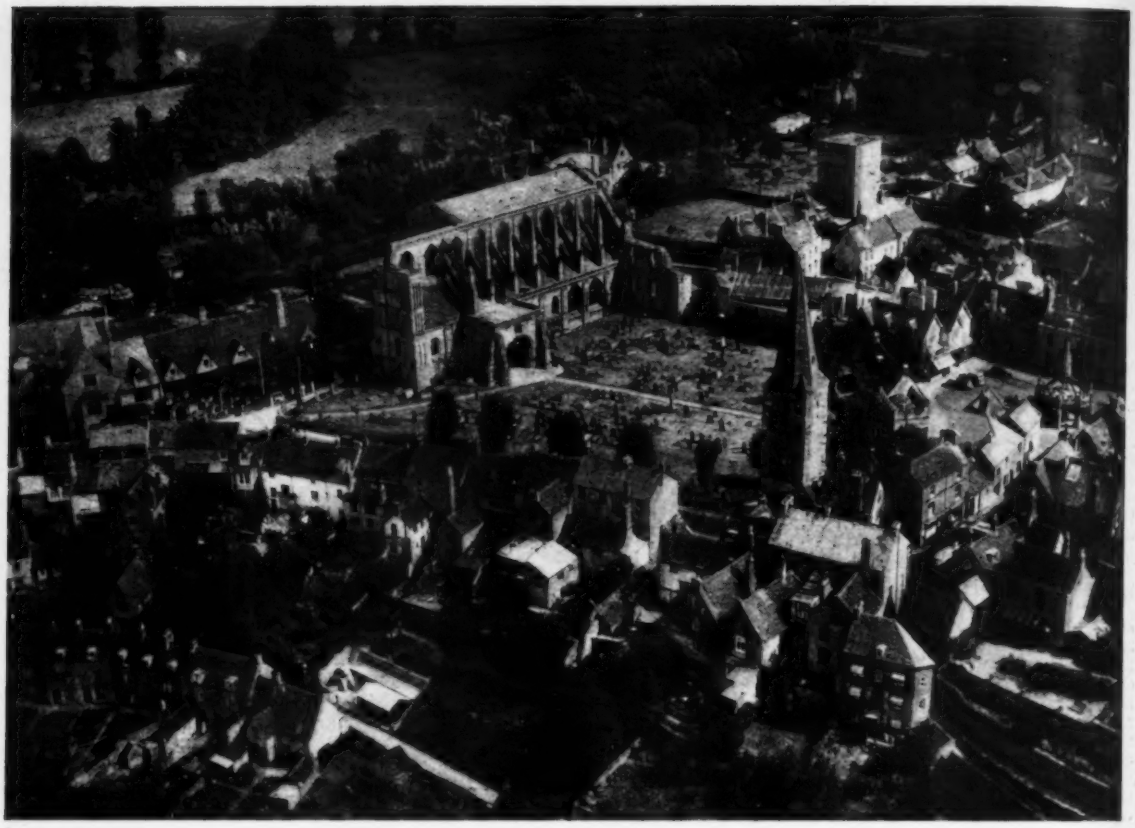
Moota Hill, the highest piece of ground on this particular leg. A bank of low cloud covered the Cumbrian Mountains, as might have been expected, and later, with the sea in full view on the right, we climbed over this mass on the way past Barrow-in-Furness. From the north-east there should be no possibility of rounding St. Bees incorrectly, though one or two competitors in the Isle of Man race mistook the coastguard station for the lighthouse itself. It was here that we were overtaken by a red Whitney Straight, obviously on its way round the course. Later we were to see it on the ground at Tilesford aerodrome, the home of the Worcestershire Flying School. Possibly the pilot (Brig.-Gen. Lewin, I believe) had been forced down by weather from which we had escaped by waiting at Speke, Liverpool.

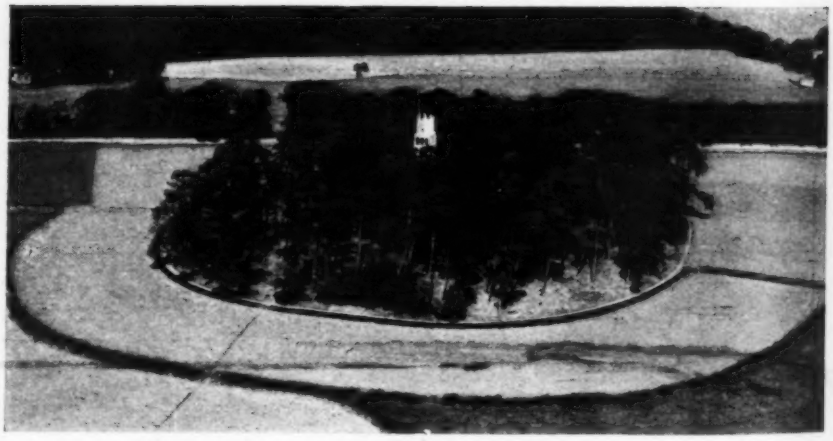
Needless to say, Liverpool is not on the course, but, after looking at Stanley Park and feeling that one or two of the pilots of the faster machines might, in certain circumstances, have difficulties there, we hit the tail end of a front. Forced down in heavy rain to 600ft. I thought of Wigan, St. Helens and Warrington and turned rapidly off towards Speke, where full weather reports would, I knew, be available. So they were—and we were advised to stay there for a few hours at least. On the Stoke-Leicester part of the route the visibility was given as 1,000 yards or less and the clouds were covering all high ground. This was front No. 1; an occluded front was due to follow on in an hour or so and travelling from the west.

When we restarted three hours later in suspiciously good local visibility the questions were simply whether we could get to Leicester before front No. 2 came along and whether, if we were caught out near Charnwood Forest or before, it would be possible to race the weather back to Stoke-on-Trent aerodrome, which lies at 600ft., anyway. In fact, everything went off perfectly well. The hills beyond Leicester were obviously covered, but at Braunstone we changed course from 134 deg. Mag. to 238 deg. Mag., and on the new track it was



Looking down the beautiful Wye Valley from the point where it is crossed on the way to Cardiff. If the Forest of Dean is cloud-covered the Severn can, of course, be followed. (*Flight* photograph.)





Malmesbury and its Norman abbey (above), probably the most distinctive landmark on the final leg. It would be difficult to imagine a spot with a more pleasantly medieval appearance. Just beyond Faringdon a white tower (right) emerges from a circular grove of trees growing on a little mound. The effect is startling enough and should provide final evidence concerning the identity of the town. (*Flight* photographs.)

perfectly safe to climb over the broken cloud layer.

The most useful landmark on the Stanley Park-Meir leg appeared to be the ruined church on the summit of Mow Cop, near Kidsgrove, which is passed on the left just before reaching the Pottery area of continuous smoke, with Meir as an extremely large, but not easily distinguishable, aerodrome ten miles farther on. The track to Leicester passes fairly well over the centre of Burton-on-Trent, where the river in question will form a distinguishing mark if there is any doubt during thick weather. On the following track there is always Coventry on the left if Hinckley, which is dead on track, is passed over without the usual reactions; at Foleshill, a mile and a half on the left, there is a large and unmistakable gasholder on which, if one is flying high enough to see, the name "Coventry" is writ large. The thing is 400ft. high, so it behoves one to err to the right if visibility is poor.

For some reason or other, the later Ordnance Survey maps do not show a perfectly good piece of railway joining the Henley-in-Arden and Birmingham line with a more easterly line going in much the same direction. Since Henley is dead on course this is a point worth remembering. I looked up a six-year-old aviation map for this part of the world, and the line which worried me so much is certainly marked on it. So it is possible for a draughtsman at Southampton to give two dozen pilots the shock of their lives, since they must, possibly under a low ceiling and in poor visibility, be careful to miss both the Malverns and the 1,000ft. Comberton bump.

The actual track from Cardiff to Hatfield passes quite close to the recognised point where the Cotswolds can be crossed in maximum safety—at Chipping Sodbury. Here the ground does not rise much above 600ft., and the inevitable tunnel is only two miles long. Just for once we had visibility of the thirty-mile order on this leg until the Chilterns were reached; even then, though the clouds were down to 1,200ft. and the rain hammered against the screen, it was still possible to see our surroundings better than at almost any time during the previous two days. Let us hope that to-morrow and Saturday provide nothing worse than that for the competitors, who must travel 1,400 miles against our feeble 900 or so.

Finally, a good word for the various airport and aerodrome control people, who, always polite, did their best to obtain weather reports and the like for us.

WHO'S WHO IN THE RACE

Some Personal Notes on the Pilots

SQN. LDR. D. F. W. ATCHERLEY (Comper Swift, No. 18).—Flying Capt. Hope's entry, David Atcherley is a brother of R. L. R. ("Batchy") Atcherley of Schneider Trophy fame. A native of York, he is 23 years of age and is at present stationed at Lee-on-Solent. Licences which he holds are (according to himself) motor (endorsed), gun, dog and "A." Is the private owner of another Comper Swift and has had experience of one previous King's Cup race (1931), from which he retired with a split fuel tank.

H. F. J BROADBENT (B.A. Double Eagle, No. 7).—Flying Mr. Victor Dupree's entry, Harry Frank Jim Broadbent, from Australia, comes into the race with experience of one previous King's Cup (1934, when he flew a Fox Moth into eighth place), but with an enviable stock of long-distance records which are testimony to his skill as a navigator; among them are two flights round Australia and an England-Australia and an Australia-England solo record. Holds the present Australia-England record of 6 days 8 hours, made with his own Leopard Moth. Twenty-seven years of age, he has 2,700 hours flying to his credit and other sports and pastimes in which he indulges include polo, tennis, golf and cricket. He prays for fine and sunny weather to-morrow and Saturday, and remarks that it would be a grand idea if people who plotted air race courses among mountains had to fly 200 m.p.h. light aircraft in the race itself.

F. C. J. BUTLER (Vega Gull, No. 11).—This is Mr. Butler's first King's Cup Race. Twenty-two years of age, lives at Faringdon, Berks, and is a Vega Gull private owner. With 450 hours flying, is holder of "A" and "B" licences. His principal recreation apart from flying is yachting.

F./O. G. R. DE HAVILLAND (T.K. 2, No. 9).—Son of a famous father, Geoffrey Raoul de Havilland is 27½ years of age, lives at Ayot St. Lawrence, Herts, is a test pilot and instructor, and holds "A" and "C" Ground Engineer's licences in addition to his "B" pilot's; has 2,650 hours to his credit. Has flown in four previous King's Cup Races, finishing fifth in one with the T.K.1; won this year's Cardiff race in the T.K.2 and was second in the Newcastle race. Numbers squash and swimming among his recreations and is interested in model aircraft. Says that he likes this year's course, as it gives a chance of picking up the odd mile or two by careful study of wind conditions and other navigational details; feels that pylon races over any distance is a boring business except on out-and-out racing craft.

(Top left) H. F. J. Broadbent. (Top right) F/O G. R. de Havilland. (Lower) Miss Lily Dillon, co-piloting with Capt. Neville Stack.

(Left) Sqn. Ldr. D. Atcherley, sending this snap, says "I am the one wearing glasses." (Below, left to right) Sqn. Ldr. E. C. T. Edwards, Flt. Lt. H.R.A.Edwards, Charles Gardner, and Giles Guthrie.

MISS L. DILLON (Vega Gull, No. 13).—Co-piloting with Capt. Neville Stack, Miss Dillon is an enthusiastic private owner from Listowel, Ireland. Flying her own B.A. Swallow, won the Ladies' Cup in this year's Oases Rally and was a member of the team that won the International Trophy for Great Britain at the recent Paris Rally. Has had no previous King's Cup experience.

SQN. LDR. E. C. T. EDWARDS (Miles Magister, No. 23).—Brother of H. R. A. and, like him, a serving officer in the R.A.F. (is at present stationed at Grantham), Edwards is 32 years of age and has 2,100 hours flying in his log-book. His first King's Cup experience was as a navigator in 1930 and subsequently he piloted in 1931 (when he won, flying a Blackburn Bluebird), 1932 and 1933 (second). Again like his brother, he likes this year's course, which he considers to be a far more sporting and better test of pilot and aeroplane than any short-circuit course can be, though he is not in favour of the 170 miles of unnecessary water crossing in addition to those to and from Ireland. His ideal is a race confined to one day and covering about 1,200 miles.

FLT. LT H. R. A. EDWARDS (Wicko, No. 29).—A serving officer in the R.A.F. stationed at Manston; has had extensive experience of race flying during recent years, and

Sqn. Ldr. A. V. Harvey.

Alex. Henshaw.

F/O A. H. Hole.

F/O Charles Hughesdon.

competed in the King's Cup races of 1932, 1934 and 1935, finishing second on a Hawk Trainer in the last-named. Was a consistent winner of all sorts of races on his little Cirrus-engined Avro Baby and at present owns something rather unique in the shape of a Sports Avian, which is not, as might be thought, a biplane, but a low-wing monoplane. Holds "A" and "B" and Second-Class Navigator's licences and has 2,050 hours to his credit. Thoroughly approves of this year's course, but feels that all time on the ground should count as flying time, otherwise fools and bad pilots are favoured. Says that the water-crossings would worry him if he had not such faith in his motor.

CHARLES E. GARDNER (Percival Mew Gull, No. 4).—Private owner of the Mew Gull and a Beechcraft, and with his own aerodrome at his home at Warlingham, Surrey, Gardner is a consistent King's Cup competitor and was last year's winner (Vega Gull) at his fourth attempt. An aeronautical engineer by profession, he holds "A" and "C" Ground Engineer's Licences, W/T Licence and Second-class Navigator's Certificate, with 1,950 hours to his credit. Pastimes apart from flying are ski-ing, squash and sailing. Is 25 years of age.

GILES GUTHRIE (Percival Vega Gull, No. 12).—At the age of 21 Guthrie has shared in two notable air racing victories; was co-pilot with C. W. A. Scott, only finisher in the England-Johannesburg Race, and shared Chas. Gardner's King's Cup success as navigator. Hails from Lavenham, Suffolk, recently came down from Cambridge and is now taking a course at A.S.T. Hopes soon to take his "B" licence and at the moment is awaiting results of a W/T licence examination. Recreations: Yachting, tennis, squash, travelling. The Vega is entered by his father, Sir Connop Guthrie.

SQN. LDR. A. V HARVEY (Miles Whitney Straight, No. 26).—Sqn. Ldr. Harvey is a director of Radio Transmission Equipment, Ltd., and is O.C. No. 615 County of Surrey (A.C.) Squadron, A.A.F. Is flying his own Miles Whitney Straight and is the holder of "A" and "B" licences, with 2,600 hours to his credit. Is 31 years of age. During the period 1931-1935 was adviser to the Southern Air Forces in China and has extensive experience of commercial and military aircraft operation in the Far East. Recreations apart from flying are sailing and golf. Considers this year's course a very interesting one, but is of the opinion that the final should be over a closed circuit.

Wing Cdr. E. G. Hilton.

WING CDR. E. G. HILTON (Miles Falcon, No. 24).—Piloting Wing Cdr. Sherren's entry, Wing Cdr. Hilton has 5,000 hours flying experience and is—or was until recently—a Martlesham pilot. He is 42 years of age. This is his first King's Cup—he has entered largely out of curiosity ("to get experience and general impression")—but he has figured in the aeronautical news in the past, having flown an Airspeed Envoy to Capetown "for fun" and brought it back rather quickly "by accident."

F/O A. H. HOLE (Percival Vega Gull, No. 16).—Personal pilot to Mr. Lindsay Everard, M.P. (who has entered the machine in this race), and manager of his private aerodrome at Ratcliffe, Alan Harold Hole is a "B" licence pilot with 1,250 hours in his log, and has served five years at home and abroad in the R.A.F. Has had no very extensive racing experience, and this is his first King's Cup. Twenty-nine years old, and numbers squash and riding among his recreations.

F/O C. F. HUGHESDON (C.W.A. Cygnet, No. 28).—A Lloyd's insurance broker, 28 years old, Hughesdon is also a part-time R.A.F. V.R. instructor, holds "B" and Instructor's licences and has 1,750 hours in his log-book. In 1936 his King's Cup effort resulted in a forced landing near Maidenhead owing to lubrication trouble, but he completed the course after two hours' delay. He was second in a Hawker Tomtit in last year's London-I.O.M. Race, and co-piloted with Llewellyn in the Johannesburg Race. Immediately after the race he is to be married to Miss Florence Desmond.

Brig. Gen. A. C. Lewin.

S. T. Lowe.

E. J. JOBLING-PURSER (Miles Whitney Straight, No. 27).—This competitor is an enthusiast of over sixty years of age, and has owned the Whitney Straight for three months. Previously he owned an Autogiro, and, before that, a Hermes IV Percival Gull. He lives near Sunderland, and is, we believe, the manufacturer of Pyrex glassware.

BRIG. GEN. A. C. LEWIN (Miles Whitney Straight, No. 25).—A very sporting effort this, by a private owner who learned to fly six years ago at the age of fifty-seven. Brig. Gen. Lewin, C.B.E., C.M.G., D.S.O., A.D.C., lives mostly in Kenya and, accompanied by his wife, he has made no fewer than seven flights in his own aircraft between there and England. He has 1,300 hours to his credit, but so far has had no racing experience. Feels, as we do, that the eliminating race is unfair on the slower machines, and thinks that there is an unnecessarily large amount of sea flying, especially in view of the fact that pilots meaning business will fly low. Makes the following frank admission about air racing in general: "I have no great opinion of the value of air racing to-day. As a sport it is far behind, say, pig sticking, steeplechasing or polo, at least for the private owner and amateur. For professional pilots and the like it is no doubt good advertisement, plus the chance of some financial gain. Personally, I have entered on this one and only occasion merely for the sake of the experience it is affording me."

S. T. LOWE (Comper Swift, No. 20).—Flying his own machine, Lowe is entering his first King's Cup Race though he has been competing consistently in smaller events during the last few years; won last year's Portsmouth-Shoreham-

Portsmouth race and this year's Manx Air Derby. Residing at Twickenham, is in the wholesale fish business, and his recreations apart from flying are golf and rugger. He is 25 years of age.

F. G. MILES (Miles Hobby, No. 2).—British aviation can show several instances of famous designers who are also pilots of more than average ability. Geoffrey de Havilland and Frank Barnwell, for example, both began to design aircraft long before the war, and both do a lot of flying even to-day. Frederick Miles is one of our younger designers (in fact, probably the youngest) to make his mark, and is regarded by many as one of our most brilliant. Before joining Phillips and Powis, worked independently at Shoreham, and even then showed promise of a refreshing individuality which has been given full rein since he became established at Reading. Is helped greatly in his work by his wife, who is herself a capable designer and who does not shy even at stress calculations. Anyone who has seen Mr. Miles demonstrate such machines as the Miles Whitney Straight will have gathered that he is a pilot of remarkable skill, and the results are, of course, traceable in his machines. When Miles the pilot reports, after a first test flight, that something could be improved, Miles the designer has usually thought of the cure before the machine is back in the works.

W. H. MOSS (Moss Monoplane, No. 31).—Mr. W. H. Moss is one of the five brothers who have branched out from their paint and varnish works at Chorley, Lancs, with the manufacture of the Moss monoplane. Has extensive flying experience, gained during the last nine years at home, in the Argentine and in U.S.A. Owns a Cirrus III Moth, apart from his own make of aircraft. This is his first serious essay at racing in this country. He is 36 years of age.

F. G. Miles.

W. H. Moss.

C. S. NAPIER (Hendy 302, No. 22).—Carill S. Napier is taking over his own Hendy for which he had originally entered Mr. H. H. Leach. The machine is one of the Cirrus-engined trio which he has entered in his capacity of technical chief of the Cirrus engine division of Blackburn's. Has competed in four previous King's Cup Races and his successes in other events include first in a heat and fourth in the final of the Newcastle Club's Grosvenor Cup Race in 1931. His one recreation apart from flying is the commendable indoor sport of darts. He believes that air-racing is good fun only when taken not too seriously.

E. W. PERCIVAL (Mew Gull, No. 3).—Capt. Percival began his aeronautical career as a transport pilot in Australia. On his arrival in this country he began to design aeroplanes, and at first had them built for him by George Parnall, of Yate. Later he established his own works at Gravesend, and recently the works were transferred to Luton. Percival has always had the happy gift of being able to get high speed out of his aeroplanes with comparatively modest power expenditure, all his types being above the average in the matter of performance. His Mew Gulls have been reported upon by Martlesham to be quite remarkably viceless in spite of their diminutive size and high wing loading, and are thus very far from being racing freaks. The particular specimen to be flown by Percival in this year's race is believed to be even faster than previous models, and probably represents just about the maximum obtainable with the power employed.

H. L. PIPER (Short Scion Senior, No. 19).—Mr. Piper is handling the one really big aeroplane in the race, but it is one that he knows inside out, for he is assistant test pilot at Short Bros. Living at Strood, Kent, he is 38 years old, has 2,600 hours' flying to his credit and likes shooting, swimming and tennis as relaxations. Has not had a great deal of racing or record-breaking experience, but once flew a Desoutter to Australia. He feels, as *Flight* does, that it is a little unfair on the slower machines to handicap on the second day only.

FLT. LT. TOMMY ROSE (Miles Hawk Speed Six, No. 8).—Perhaps the best known, and certainly one of the most popular, of our sporting pilots, Tommy Rose is a previous King's Cup winner—in 1925, flying a Miles Falcon—and was second last year, in a Hawk Speed Six. Has any number of other air-race and long-distance record successes to his credit, including a Capetown flight last year—in the Falcon—in 3 days 17 hours 38 minutes, with a return trip almost as fast. Was once instructor at Sywell, then sales demonstrator and test pilot at Phillips and Powis, and is now flying representative of the distillers of an "aviation spirit" of high octane value—Seager's gin. Is *not* in favour of the 1937 course.

DEREK SCHREIBER (Percival Vega Gull, No. 15).—Flying his own machine, Schreiber is taking part in his third King's Cup Race, having flown in 1930 and 1931. He has a total of 500 hours' flying. Thirty-three years of age, he resides at Woodbridge, Suffolk, and enjoys polo, hunting, shooting and other sports.

WING CDR. F. W. STENT (Miles Sparrowhawk, No. 10).—A retired R.A.F. Officer, 46 years of age, Wing Cdr. Stent has extensive flying experience (2,000 hours) gained at home and abroad. Lives at Sonning, Berks, and gives a hand with the demonstrating and testing of Phillips and Powis aircraft. This is his first essay at air racing. Remarks that the weather is bound to affect the various aircraft very differently irrespective of their pilots. Doesn't want a cabin machine and likes a low-wing monoplane because it leaves the inside of the turn visible on a bank.

G. M. TONGE (Vega Gull, No. 14).—Mr. Tonge is a private owner of the Vega Gull, of which he took delivery last July.

R. J. WAIGHT (T.K 4, No. 1).—Robert John Waight, De Havilland chief test pilot, has 2,100 hours' flying experience at the age of 27 and holds "A" and "B" and Ground Engineer's "A" and "C" licences. Last year on the T.K.2 he made the fastest time in his first King's Cup Race, and during the same season he won the Cardiff Race. Understandably in view of the type of machine which he usually races, Waight prefers pylon racing over a short course.

K. H. F. WALLER (D.H. Comet, No. 5).—Although not a pilot of long standing (having learnt to fly in 1930), Ken Waller quickly made a name for himself, and as an instructor at Brooklands he has piled up very many hours (4,000) in a comparatively short period. In the England-Australia race he piloted, with Cathcart Jones, the Comet which secured fourth

C. S. Napier.

Capt. E. W. Percival.

H. L. Piper.

Flt. Lt. Tommy Rose.

Derek Schreiber.

Wing Cdr. F. W. Stent.

R. J. Waight.

Ken Waller.

place, and brought the machine back to this country within less than a fortnight of the start from Mildenhall, having covered in that time some 23,000 miles. In December, 1935, Waller flew the Comet from Brussels to the Belgian Congo and back in company with a Belgian pilot in less than 45 hours' flying time. In the King's Cup Race Waller will fly the actual Comet on which Scott and Campbell Black won the England-Australia race.

C. H. WILLIS (B.A. Eagle, No. 30).—Entered for the race by W. C. Potter, an official of the Insurance Flying Club, Willis recently became an assistant instructor to the Club. He was one of the first members of the R.A.F.V.R. to be trained at the Hanworth School. He has had no extensive racing experience, though he took part in the Isle of Man race last June with Mr. C. B. Field in the Tomtit. He is a Londoner, 28 years of age.

A PROPORTIONAL DEPARTURE

Miles Hobby is Longer Than its Span : Wide Track : Series II Gipsy Major

With its feet tucked up, and with a final coat of dope, the Miles Hobby will look far prettier than it does in this, its experimental state. Other photographs appear elsewhere in this issue.

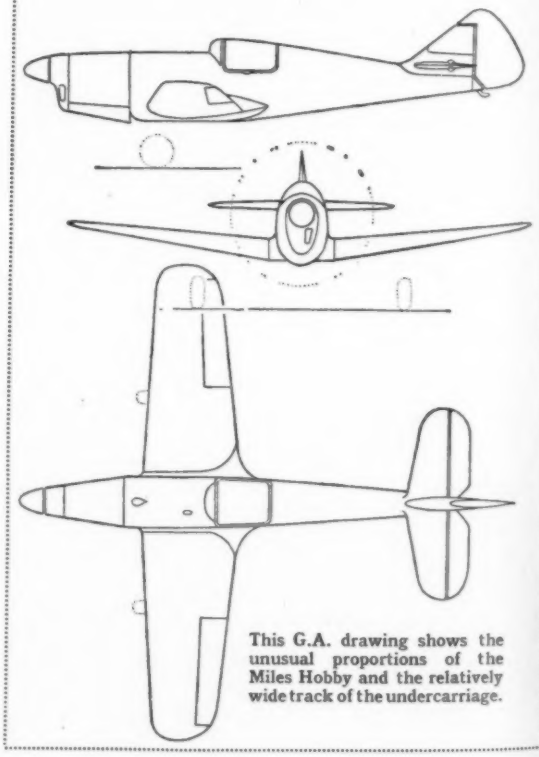
A CHARACTERISTIC feature of M. Marcel Riffard's Caudron racing monoplanes has been the unusual length of the fuselage in relation to the wing. Such proportions have rarely, if ever, been seen in this country, which makes the design of the new Miles Hobby King's Cup racing monoplane all the more interesting.

The actual dimensions are: Span 21ft. 5in., length 22ft. 8in., height (to tip of airscrew) 8ft. 7in., wing area 80 sq. ft.

A Gipsy Major Series II engine is fitted, driving, of course, a "1,000" size D.H. v.p. airscrew. The undercarriage—of no less than 9ft. 6in. track—retracts inwardly and Miles flaps are used in the cockpit enclosure. A very neat Perspex windscreen is incorporated.

The Hobby made its first flight only a few days ago, so complete performance figures are not available. A reasonable estimate of the maximum speed, however, would be a few m.p.h. plus or minus 200 m.p.h.

It is unlikely that the Hobby will be quite as fast as its rival—the T.K.4—in view of its somewhat larger size and greater wing area.



This G.A. drawing shows the unusual proportions of the Miles Hobby and the relatively wide track of the undercarriage.

R.Ae.S. Examinations

THE next Associate Fellowship and Associate Membership examinations of the Royal Aeronautical Society will be held at 7, Albermarle Street, London, W.1, on Wednesday, December 8, and Thursday, December 9. Intending candidates should send in their entries before September 30, 1937.

Hangar Construction Tenders

THE Indian Stores Department is calling for tenders for the supply and erection of an aircraft hangar, 200ft. long by 100ft. clear span, for the Royal Air Force at Karachi. Details are obtainable from the Department of Overseas Trade. The invitation remains open until September 27.

Three Percival Mew Gulls—two with Series II Gipsy Six engines—are entered. This view is of Alex Henshaw's machine with Series I engine.

All the Vega Gulls except one, as shown here, will have Series II Gipsy Sixes with D.H. v.p. airscrews.

THE FIELD

Nineteen Distinct Types Entered for the King's Cup Race : Our Finest Light Aircraft Represented

ALTHOUGH the great majority of this year's King's Cup entries are, as is usually the case, straightforward private-owner types, there is a sprinkling of machines on the entry list which may be regarded as specially constructed racing models. These are typified by the two T.K. types, the Mew Gulls, the Miles Hobby and the Comet.

Making up in all-round efficiency what they lack in glamorous speed, such machines as the Miles Whitney Straights, the Vega Gulls and the somewhat less strongly represented hopes of other manufacturers will be flying advertisements for the quality of modern British touring aircraft of the 2-4-seater category, in which class Great Britain undoubtedly leads. Three machines—the Wicko, C.W. Cygnet and Moss—are entirely new models. Their performance will be closely studied.

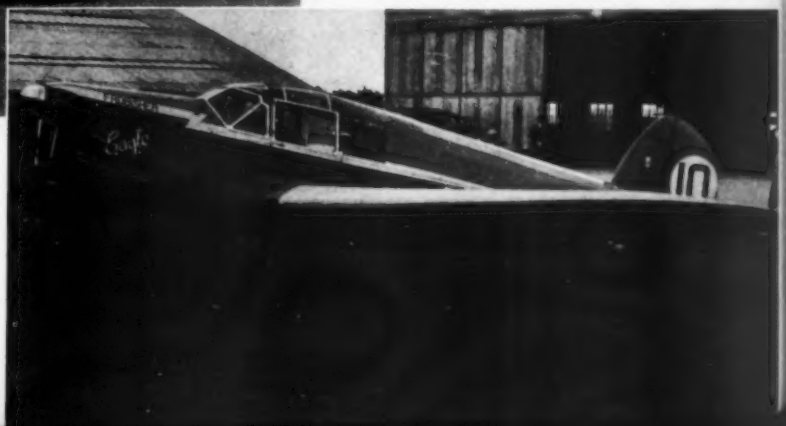
The various types will be dealt with hereafter under the headings of their manufacturers.

Percival

Mew Gull.—One of the most intriguing sporting aeroplanes built in this country for many years, the Mew Gull, despite its outstanding performance, is comparatively docile. This season the Mew Gull has been the mount of Charles Gardner (last year's King's Cup victor on a Vega Gull) and Alex Henshaw. Both these young sportsmen have entered their Mews for this year's event, in which they will be racing against Captain Percival, who will be similarly mounted. Captain Percival is responsible for the design of all the machines in the outstandingly popular Percival range.

While Henshaw's machine employs the Series I Gipsy Six engine, the other two are fitted with the new Series II unit and D.H. v.p. airscrew. Henshaw's mount should do about 225 m.p.h., while Gardner's is a few m.p.h. faster. Captain Percival's machine is the very latest model with slightly less wing area, and should be faster than either.

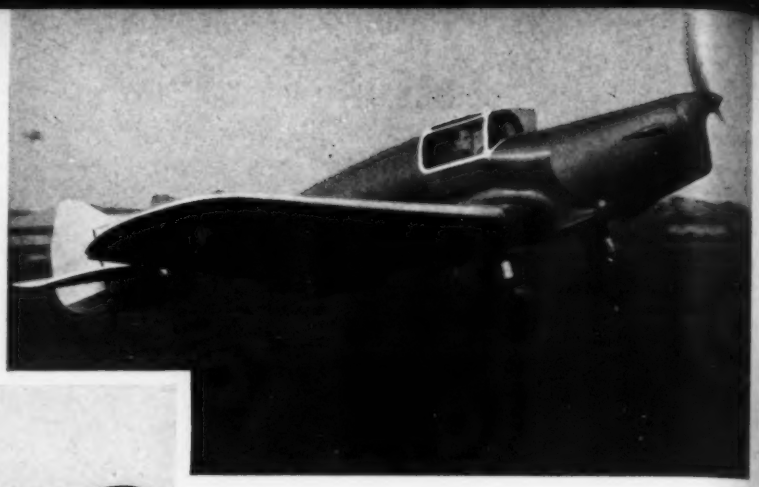
Vega Gull.—All six Vegas are standard products with faired-in wing joints. That to be flown by Mr. A. J. Hole differs from its companions in that it is fitted with the Series I Gipsy Six, whereas the others have the Series II engine with D.H. v.p. air-

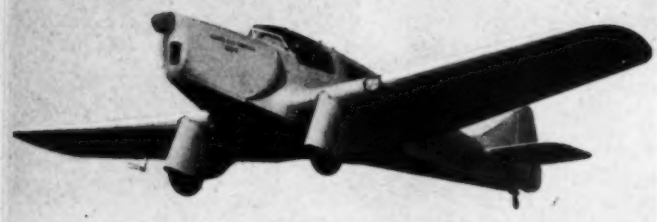


One of the B.A. Double Eagles entered has Gipsy Sixes (Series I) and the other Gipsy Majors. The more powerful version should do 190 m.p.h. On the right is the B.A. Eagle (Gipsy Major).

screw. In either case the Vega is capable of over 170 m.p.h., but the newer engine, of course, confers an all-round increase in performance.

The Vega Gull normally seats four, although in a recent Italian event one—which won by a large margin of points—was specially licensed to carry five, giving an indication of the potentialities of the type.





Miles

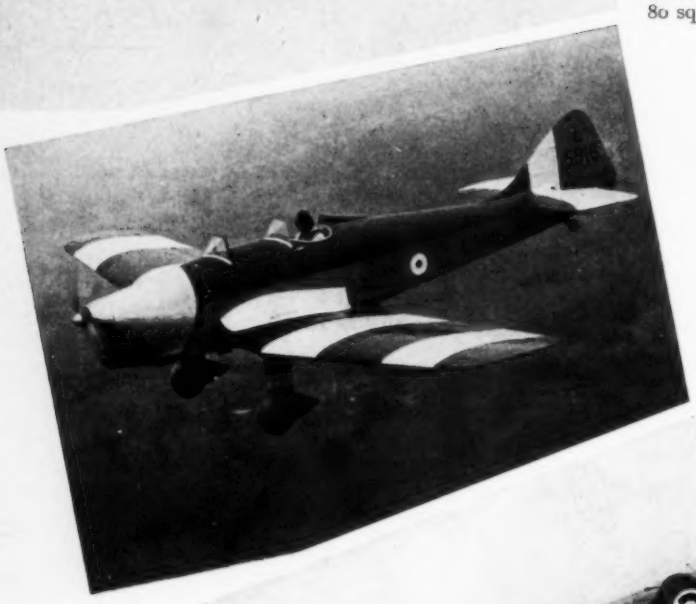
Hobby.—The very latest brain child of Mr. and Mrs. F. G. Miles, the Hobby is a diminutive sporting monoplane which, being fitted with the new Gipsy-Major Series II engine and v.p. airscrew, should make a most interesting comparison with the even tinier T.K.4, which has a similar power plant. Unlike the remaining Miles machines in the race, the Hobby has a retractable undercarriage. Dimensions are: Span 21ft. 5in., length 22ft. 8in., and wing area 80 sq. ft., and the all-up weight is 1,575lb. The machine is completely new, and Mr. Miles can hope to get in very little test flying before the day of the race. A drawing appears elsewhere.

Whitney Straight.—Essentially the Whitney Straights are standard products, but in some cases small additional fairings have been added. The Whitney Straight is a side-by-side two-seater with Gipsy Major engine and is capable of 145-150 m.p.h. As in the other Miles models, patent split trailing-edge flaps are incorporated.

Magister.—The Magister may be regarded as the latest development of the Hawk series and is first and foremost a trainer. In this capacity it has been adopted for the *ab initio* instruction of Service pilots. Sqn. Ldr. Edwards' King's Cup mount will differ from the Magisters so far built in that it is fitted with the Cirrus Major engine instead of the equivalent De Havilland unit. It will be flown as an open two-seater. The speed will probably be in the neighbourhood of 150 m.p.h.

Hawk Speed Six.—Flt. Lt. Tommy Rose is remaining faithful to his last year's mount, which he brought into second place. The machine, a specially developed single-seater, is unaltered and is fitted with Gipsy Six engine driving a fixed-pitch airscrew. Rose's average last year was 184.2 m.p.h.

Falcon Major.—Although now out of production, the Falcon Major has given a good account of itself as a private touring

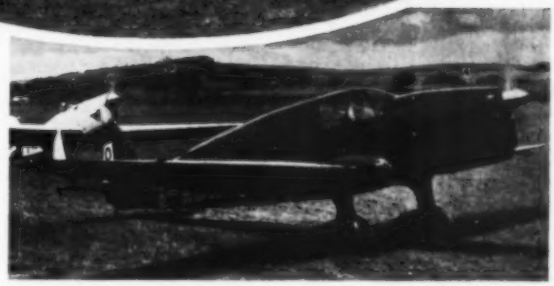


From top to bottom these Miles types represented, in addition to the Hobby, are the Whitney Straight, Falcon, Magister, Sparrowhawk and Hawk Speed Six.

The D.H. Comet (above) is now fitted with two Series II Gipsy Sixes. It came fourth in the recent Damascus race. On the right are the T.K.4 (top) and the older T.K.2 built by D.H. Technical students.

machine. Wing. Cdr. Hilton's Falcon is, to all intents and purposes, a standard model and should be capable of something like 150 m.p.h.

Sparrowhawk.—Two years ago Mr. Miles built himself a little racing machine which he called provisionally the M.5, just as this year his pet is the Hobby. The M.5 became popular among sporting pilots, and was subsequently christened the Sparrowhawk, taking its place as a standard product in the Miles range. The machine to be used by Wing Cdr. Stent has a standard Gipsy Major I engine and should be good for something like 180 m.p.h.



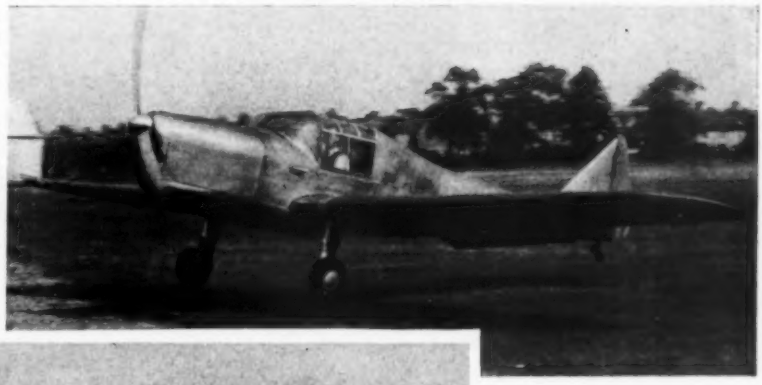
British Aircraft

Double Eagle.—Two standard examples of this, one of our fastest light transport monoplanes, are entered this year. One of these has Gipsy Six engines, and the other is powered with Majors. The former type should do 190 m.p.h.

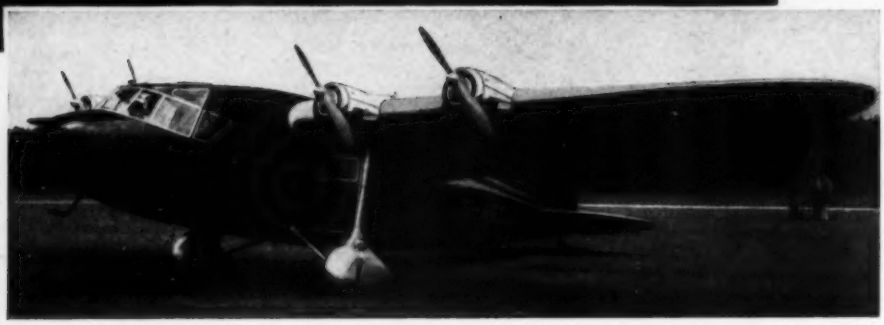
The Double Eagle carries five passengers in addition to the pilot, and is characterised by the curious swept-down centre section of its wings.

With Flt. Lt. J. B. Wilson " up " the Gipsy Six version was flown into third place in last year's event.

Eagle.—The B.A. contingent will also include a pair of standard Eagle light cabin monoplanes with Gipsy Major engines. The Eagle, among the most efficient machines of its class ever built, is capable of nearly 150 m.p.h.



As flown in the King's Cup Race, the new C.W.A. Cygnet (above) has the Cirrus Major 150. A similar power plant is installed in the equally new high-wing Wicko (left).



The Moss Bros. monoplane (left) is a new Pobjoy-engined tandem two-seater which will be making its debut. The four-engined machine is the Short Scion Senior, likewise Pobjoy-powered.

De Havilland

Comet.—Mr. Ken Waller should feel quite at home on the Comet, having made a number of outstanding long-distance flights on a similar machine. His mount has lately distinguished itself by flying into fourth place in the Marseilles-Damascus-Paris race with F/O. Clouston, who was originally listed to fly it in the King's Cup Race, as pilot. The Comet's history goes back to 1934 when, as *Grosvenor House*, it scored a glorious victory in the Mac-Robertson England-Australia race. It was subsequently purchased by the Air Ministry for experimental purposes.

In its present form the Comet is fitted with a pair of standard Gipsy Six IIs driving D.H. v.p. airscrews. A number of minor modifications have been incorporated, but the performance is believed to be substantially the same as that of the original version with "R" engines, which means that the maximum speed is of the order of 230 m.p.h.

De Havilland Technical School

T.K.—The smallest machine ever built in this country, this, the latest effort by D.H. students, incorporates leading-edge slots and trailing-edge flaps. Its structure is of more than passing interest, balsa wood being employed for such parts as wing tips, slots and rudder, and the ingenious inwardly retracting Dowty-designed undercarriage is worthy of note because it is believed to be the smallest of its kind in the world.

A description of this fascinating little aeroplane was given in *Flight* of August 12, 1937. Data are: Span 19 ft. 8 in., length 15 ft. 6 in., all-up weight, 1,180 lb., designed speed 215 m.p.h., and landing speed (estimated), 62½ m.p.h.

The engine is one of the new D.H. Gipsy Major IIs driving a "1,000" size two-position D.H. airscrew.

T.K.2.—A familiar entry in most of the worth-while air races in this country, this earlier Technical School product is powered with a high-compression Gipsy Major. The low monoplane wing is of thin section and tapers sharply. A fixed undercarriage is used and the whole machine is very carefully faired, permitting a maximum speed of over 180 m.p.h.

Data are: Span 32 ft., length 22 ft. 2½ in., wing area 125 sq. ft., weight loaded 1,630 lb.

The original version of the T.K.2 was placed fourth in the 1935 King's Cup Race.

Short

Scion Senior.—The first Scion Senior was a seaplane, and examples of this version have been sold abroad. From the start, however, the machine was planned for use on either floats or wheels, and when the performance of the landplane, as entered for the race, is reduced to figures of comparative commercial efficiency it reflects very great credit on the designers.

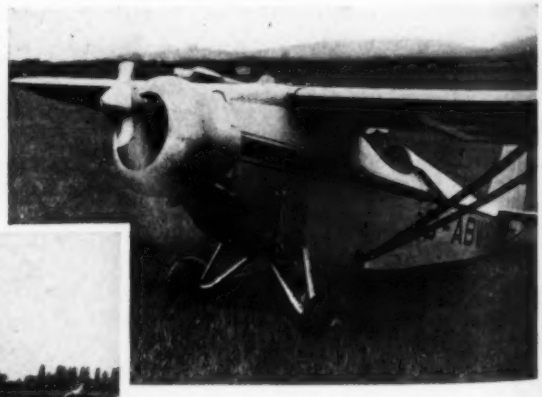
As a matter of interest, a Scion Senior was used as a small-scale "trial horse" for the testing of certain of the advanced features of the big Short Empire type flying boats now in production for Imperial Airways.

The actual machine entered for the race has been used extensively for demonstration work. Powered with four 95 h.p. Pobjoy Niagara III radials it is capable of a maximum speed of 145 m.p.h. and of cruising at 126 m.p.h. Accommodation may be provided for a maximum of nine passengers.

Moss

Moss Monoplane.—A somewhat unusual little monoplane, this, the first effort of Moss Brothers Aircraft, Ltd., of Chorley, will be making its début in the King's Cup Race. Tandem seating is provided for the two occupants, the situation of the front seat affording an excellent view downward. Preliminary performance calculations showed that, powered with a 95 h.p. Pobjoy Niagara III engine, the machine should be capable of a cruising speed of over 120 m.p.h.

An interesting sidelight is the fact that the five directors



Mr. Lowe's Pobjoy-engined Comper Swift (above) embodies a number of alterations as compared with the original of some years ago. A Gipsy-powered version is also racing.

The Hendy 302 has been used as a flying test bed for the new Cirrus Major 150 engine.

of the company responsible for the machine are all brothers and each has had practical flying experience.

Data are: Span 34 ft., length 23 ft., weight empty 860 lb., weight loaded 1,260 lb., fuel capacity 21 gallons.

Wicko

Cabin Monoplane.—In the first instance this new high-wing, strut-braced monoplane was powered with a converted Ford vee-eight engine, but a quest for increased performance led to the adoption of the new Cirrus units—the Minor or the Major. The machine will appear in the race with the latter engine and should have quite a fair turn of speed, considering that the Minor-engined version, with 60 h.p. less, does 120 m.p.h.

The span and length are, respectively, 31 ft. 6 in. and 23 ft. 3 in. The interesting flying qualities of the prototype were discussed in *Flight* of July 8 this year.

C.W.A.

Cygnet Major.—Outstanding in its class because of its stressed-skin construction, the Cygnet, to be raced with the Cirrus Major engine, is another type which will be making its first sporting appearance. Performance figures for the latest version are not available, but it is known that the peculiar tadpole layout which characterises the machine is very efficient aerodynamically. The two occupants are seated side-by-side.

Comper

Swift (Pobjoy).—Essex Aero, Ltd., have lately been busy coaxing a few additional m.p.h. out of Mr. Lowe's Swift, which has already made its mark in sporting events. The engine—a Pobjoy Niagara III—has a special long chord cowling which, quite apart from being very efficient aerodynamically, gives excellent cooling. Control surface joints have been faired over, and the V formed by the lift struts has been faired in to within 6-8 inches of the wing. Special wheel fairings are incorporated and strut joints have been smoothed off. The air intake is of special design, and should give a ramming effect.

Swift (Gipsy).—The veteran "WH" in the hands of Sqd. Ldr. D. Atcherley is one of two special Swifts built some years ago to take the Gipsy III engine. This version was capable of something like 165 m.p.h. in its original state, but additional fairings should increase the speed by a few m.p.h.

Hendy

302.—A pioneer light cantilever monoplane of a type which never reached the production stage, the 302 has lately been used as a flying test bed for the new Cirrus Major 150 engine, with which power plant it has been entered for the race. During the past seven years G-AAVT has been used as a tourer, racer, air taxi and for engine experiments, and now, rejuvenated, may still give some of the "young 'uns" a run for their money.

R.Ae.C. Official Notice

SUPPRESSION of Housing and Landing Fees.—Sweden: The Royal Aero Club has now completed arrangements whereby British private air tourists, holding the F.A.I. Identity Card, issued by the Club, are entitled to exemption from landing and take-off fees, and are given free hangarage for their aircraft for a period of 48 hours at the following aerodromes in Sweden:—

Civil Aerodromes: Feringe, Goteborg-Torslanda, Eskilstuna, Jonkoping, Malmo-Bulltofta, Norrkoping, Stigtomta, Stockholm-Bromma, Svarteborg.

Military Aerodromes: Karlsborg, Ljungbyhed, Malmslatt, Rinkaby, Skillingaryd, Visby, Vannas, Vasteras-Hasslo, Ostersund-Froson.

It should be noted that the military aerodromes may be used only after previous notification.

Caustic Capacity

SOME years ago alkaline batteries were looked upon with favour by the R.A.F. because of the advantages conferred by absence of acid, by the use of steel plates (which are not affected by vibration, shocks, and adverse charging conditions), and by an unspillable steel container. With the introduction of electric engine starting this type of battery temporarily lapsed in popularity because it could not give the necessary high output.

Research has now put this matter right, and modern alkaline batteries are claimed to offer all the advantages named above, and also additional ones which include a very long, trouble-free life. This is chiefly due to the fact that the electrolyte, caustic potash, has a preservative effect on the steel container; more important, it also undergoes no chemical combination with the plates, as is proved by its fixed specific gravity; such inertness, it is stated, means that no local action, self discharge or deterioration analogous to sulphation in an acid cell can take place.

The positive plate of the alkaline cell is of nickel hydrate and the negative of iron and cadmium oxide, both these electro-chemically active materials being enclosed in a finely perforated steel envelope. The permanent retention of active material prevents the formation of sediment and is chiefly responsible for the exceptionally long life which is claimed for this particular type of cell.

These Nife cells, as they are called, can be left indefinitely either charged or discharged without appreciable harm, and parts of the same battery can carry different loads without damage.

Two nine-cell units of 55 amps. capacity are supplied as standard equipment for Short Empire boats. Several R.A.F. squadrons are being equipped, and British Power Boat tenders also have these cells. In each case engine starting is a regular duty.

Batteries, Ltd., of Hunt End Works, Redditch, are the makers of these all-steel cells.

A Useful Comparator

DESIGNED to check and compare cylinder bore measurements and other internal dimensions, a comparator known as the Subito gauge has recently been marketed in this country.

The size 100 comparator in use for cylinder-bore measurement. The distance piece and spring plunger are seen in the cylinder bore.

When using the instrument the correct one of a set of distance pieces and washers supplied with the instrument is inserted and the length across the points from distance piece to spring plunger is measured accurately with a micrometer. When the plunger is pressed into the exact diameter, the dial is set to zero by the needle, the scale being graduated to read in either direction from 0. The distance pieces are graduated in millimetres, but readings of $\frac{1}{100}$ mm. or $\frac{1}{10000}$ in. can be supplied irrespective of this fact.

Twelve sizes of the instrument are available, and each has ten or more fixed distance pieces. Size 410, for instance, is the largest standard set. It has a range of from 280 to 410 mm. (11.024 to 16.141 in.), and has fourteen distance pieces and four sizes of washers to go with them. The dial reading is in 0.01 mm. Size 60 is for much smaller limits and deals with $1\frac{3}{8}$ to $2\frac{3}{8}$ in., dial readings being in 0.001 in. Size 20, the smallest of all, is for jobs between 12 and 20 mm.

The instrument is simple and quick to handle and read, and has a direct method of transmission under pressure of springs which, it is claimed, will retain its accuracy where a lever and cone type might wear and develop play.

Already, it is stated, this comparator is used by many large engineering firms. Enquiries should be made to Aug. E. Menuge, Worplesdon, Surrey.

B.S.I. Data

THE British Standards Institution has recently issued its handbook of information, including the 1936-37 annual report and indexed list of B.S.I. specifications up to July, 1937. Copies are obtainable, price 1s., from the Institution at 28, Victoria Street, London, S.W.1.

THE RULES and REGULATIONS

THIS year's race for the King's Cup, the sixteenth of the series, has been planned to cover the greater portion of the British Isles in order to give a maximum number of people the opportunity to see the race at the controls or turning points. The race, as in previous years, is confined to British subjects and British aircraft and engines. Moreover, the aircraft must have been originally designed for use in civil flying. The only stipulation concerning the pilots is that they must have had 100 hours' experience of solo flying.

Competing aircraft are divided into two classes, Class A being for aircraft the engines of which do not exceed 150 b.h.p. total at the maximum permissible r.p.m. Class B is for machines with engines exceeding 150 b.h.p.

The race itself is divided into two parts, an eliminating trial, to be flown to-morrow, September 10, with start at Hatfield and finish at Baldonnell aerodrome, Dublin, and the final, from Dublin to Hatfield, to be flown on Saturday, September 11. The different controls and turning points are shown in the table on p. 254 and the map on p. 252.

What is Required of King's Cup Competitors

For the eliminating contest there is no handicap, and speed is used as the basis, two-thirds of the machines in each class which cover the course in the shortest time being passed into the final. There are seventeen machines entered in Class A, so that twelve machines in this class, assuming all to start and finish the course, will be in the final. Of the fourteen machines in Class B, ten will pass into the final. Thus if all thirty-one machines start and finish the eliminating contest, there will be twenty-two in the final. It is stipulated that if any machine fails to complete the course in ten hours it will be disqualified. The first machine will be started from Hatfield at 9 a.m.

The final of the race is to be a handicap, and there will be no adjustment of handicap allowances after the eliminating contest. Competitors will leave Baldonnell aerodrome in the order of their handicap allowances, the first man being due to depart at 11.30 a.m. For the purpose of the handicap the minimum handicap speed is 130 m.p.h. The race is expected to finish at Hatfield at about 6 p.m. on Saturday.

In the eliminating contest there are four controls at which landings are compulsory and at which a stop of half an hour must be made. Doubtless competitors will take the opportunity to replenish their tanks at these controls. At the turning points the machines must pass within 500ft. of the mark, which is either a building or a white cross, according to the locality, but do not have to land. If they do land, the time spent on the ground will count as flying time. The four controls in the eliminating contest are: Wolsington Aerodrome, Newcastle; Dyce Aerodrome, Aberdeen; Renfrew Aerodrome, Glasgow; and Ards Aerodrome, Newtownards.

The time for the compulsory stops at controls will be

THE KING'S CUP RACE, SEPTEMBER 10 and 11.

No.	Reg.	Class.	Aircraft.	Engine.	Pilot.	Entrant.
1	G-AETK	A	T.K.4	Gipsy Major	R. J. Waight	Viscount Wakefield
2	G-AFAW	A	Miles Hobby	Gipsy Major	F. G. Miles	F. G. Miles
3	G-AFAA	B	Percival Mew Gull	Gipsy Six	Capt. E. W. Percival	Viscountess Wakefield
4	G-AEKL	B	Percival Mew Gull	Gipsy Six	C. E. Gardner	C. E. Gardner
5	G-ACSS	B	D.H. Comet	Two Gipsy Six	K. F. H. Waller	F. E. Tasker
6	G-AEXF	B	Percival Mew Gull	Gipsy Six	Alex. Henshaw	Alex. Henshaw
7	G-AEIN	B	B.A. Double Eagle	Gipsy Six	H. F. J. Broadbent	Victor Dupree
8	G-ADGP	B	Miles Hawk Speed Six	Gipsy Six	Flt. Lt. T. Rose	H. S. Horne
9	G-ADNO	A	T.K.2	Gipsy Major	F/O. G. R. de Havilland	Capt. G. de Havilland
10	G-ADNL	A	Miles Sparrowhawk	Gipsy Major	Wing Cdr. F. W. Stent	Maj. E. Howard
11	G-AEZL	B	Percival Vega Gull	Gipsy Six	F. C. J. Butler	F. C. J. Butler
12	G-AFAU	B	Percival Vega Gull	Gipsy Six	Giles Guthrie	Sir Connop Guthrie
13	G-AEYD	B	Percival Vega Gull	Gipsy Six	Miss L. Dillon and Capt. T. Neville Stack	Miss L. Dillon
14	G-AEZK	B	Percival Vega Gull	Gipsy Six	G. M. Tonge	G. M. Tonge
15	G-AEZJ	B	Percival Vega Gull	Gipsy Six	Derek Schreiber	Derek Schreiber
16	G-AELE	B	Percival Vega Gull	Gipsy Six	F/O. A. H. Hole	W. Lindsay Everard, M.P.
17	G-ADVV	B	B.A. Double Eagle	Gipsy Six	H. F. J. Broadbent	Victor Dupree
18	G-ABWH	A	Comper Swift	Gipsy III	Sqn. Ldr. D. Atcherley	W. L. Hope
19	G-AECU	B	Short Scion Senior	Four Pobjoy Niagara III	H. L. Piper	H. O. Short
20	G-ABWE	A	Comper Swift	Pobjoy Niagara III	S. T. Lowe	S. T. Lowe
21	G-ACRG	A	B.A. Eagle	Gipsy Major	C. M. McCarthy	C. M. McCarthy
22	G-AAVT	A	Hendy 302	Cirrus Major	C. S. Napier	C. S. Napier
23	G-AEZP	A	Miles Magister	Cirrus Major	Sqn. Ldr. E. C. T. Edwards	C. S. Napier
24	G-AENG	A	Miles Falcon	Gipsy Mk. I	Wing Cdr. E. G. Hilton	Wing Cdr. P. Sherren
25	G-AEZO	A	Miles Whitney Straight	Gipsy Major	Brig. Gen. A. C. Lewin	Brig. Gen. A. C. Lewin
26	G-AEVH	A	Miles Whitney Straight	Gipsy Major	Sqn. Ldr. A. V. Harvey	Sqn. Ldr. A. V. Harvey
27	G-AEWK	A	Miles Whitney Straight	Gipsy Major	E. J. Jobling-Purser	E. J. Jobling-Purser
28	G-AEMA	A	C. W. A. Cygnet	Gipsy Major	F/O. C. Hughesdon	J. I. Waddington
29	G-AEZZ	A	Wicko	Cirrus Major	Flt. Lt. H. R. A. Edwards	C. S. Napier
30	G-ADID	A	B. A. Eagle	Gipsy Major	C. H. Willis	W. C. Potter
31	G-AEST	A	Moss-Monoplane	Pobjoy Niagara III	W. H. Moss	W. H. Moss

Classes: A = Up to 150 h.p. B = Exceeding 150 h.p.

HANDICAP ALLOWANCES IN THE FINAL.

Racing No.	Pilot.	Handicap Allowance.
		h. m. s.
31	Moss	2 04 04
30	Willis	1 55 41
27	Jobling-Purser	1 55 41
26	Harvey	1 53 40
24	Hilton	1 51 40
25	Lewin	1 49 42
19	Piper	1 45 51
22	Napier	1 45 51
21	McCarthy	1 43 58
23	E. C. T. Edwards	1 42 15
20	Lowe	1 42 15
28	Hughesdon	1 38 28
29	H. R. A. Edwards	1 24 49
18	Atcherley	1 21 38
17	Broadbent	1 11 04
16	Hole	1 08 12
15	Schreiber	1 05 25
14	Tonge	1 05 25
13	Miss Dillon and Stack	1 05 25
12	Guthrie	1 05 25
11	Butler	1 04 44
10	Stent	1 01 21
9	De Havilland	0 52 24
8	Rose	0 41 53
7	Broadbent	0 41 53
6	Henshaw	0 10 37
2	Miles	0 09 01
4	Gardner	0 08 14
5	Waller	0 07 27
3	Percival	0 02 10
1	Waight	Scratch

taken from the moment the aeroplane, in flight, crosses the arrival line between two arrows on the aerodrome. After landing, the competitors will taxi to the control tower to have their racecards signed, and afterwards they will go to the petrol pumps for replenishing their tanks, should this be necessary. At the end of the half-hour period, the competitors will be started off again by the dropping of a green flag.

THE FINAL

In the final, competitors will, as already mentioned, be started from the Baldonnell aerodrome in the order of their handicap allowances. Compulsory stops of half an hour's duration have to be made at Newtownards and Blackpool (Stanley Park), and at Pengam Moors Aerodrome (Cardiff) there is a stop of 45 minutes. The procedure is the same as at the controls of the eliminating contest.

At Hatfield the finishing line will be marked by two arrows on the aerodrome, and competitors must finish by flying across the line, in the direction indicated by the arrows, at not more than 500ft. No exact time can be given, but it is expected that the finish will take place between 5 p.m. and 6 p.m. For instance, a machine flying at an average speed of 135 m.p.h. and leaving Baldonnell at 11.30 a.m. would take approximately 4 hours 52 minutes actual flying time to cover the distance of 656 miles to Hatfield. To this must be added 1 hour 45 minutes for the three compulsory stops, so that such a machine would arrive at Hatfield at a few minutes past 6 p.m. If the handicapping is perfect the other machines would, of course, arrive at the same time. If one or more succeeds in "cheating" the handicappers they may arrive at Hatfield some time before six.

TIMES OF ARRIVAL

Many readers of *Flight* will undoubtedly wish to know the approximate times to expect competitors at the different controls. Owing to the fact that the machines will be started off from Hatfield in somewhat arbitrary sequence, and not in the order of the handicap allowances given in the final, it is impossible to give accurate forecasts of arrival times at controls during Friday's eliminating contest. The best that can be done is to assume that the fast machines will be started off first and the slow machines last, which may or may not happen. By so doing one obtains an "outside limit" of the earliest and latest times, providing no unforeseen obstacles arise, such as postponement of the start due to bad weather conditions.

On the assumption that the first machine is started from Hatfield at 9 a.m. on Friday, and that it covers the course at an average speed of 210 m.p.h., and that the last machine is started at 9.30 a.m. and is the slowest in the race at 130 m.p.h., the following approximate times are found to apply. (There are four controls *en route*, at which a compulsory stop of 30 minutes must be made.)

AN APPROXIMATION

The first machine, on this basis, should arrive at the Newcastle control at 10.23 a.m. and the last at 11.45 a.m. At Aberdeen (Dyce) the arrival times should be 11.41 and 1.33 respectively, at Glasgow (Renfrew) 12.46 and 3.0, at Newtownards 1.46 and 4.19, and at Dublin (Baldonnell) the first machine to complete the eliminating contest may be expected at 2.42 p.m., while the last should not arrive later than 5.32 p.m., although it should be emphasised that these times are very approximate only. The order of starting may be such that the first arrivals take place later and the last earlier than these times.

In the final, which starts from Baldonnell aerodrome, Dublin, on Saturday, September 11, at 11.30 a.m., there are three controls. At two of these there is a compulsory stop of 30 minutes, and at the third, Pengam Moors Aerodrome, Cardiff, the stop is of 45 minutes.

On the assumption that the limit man leaves Dublin at 11.30 a.m. and that he averages 130 m.p.h. all the way, he should reach the first control at Ards aerodrome at 12.13 p.m., Blackpool (Stanley Park) at 2.19 p.m., Cardiff at 4.34 p.m. and Hatfield at about 6.18 p.m.

SATURDAY AT HATFIELD

Saturday at Hatfield will not be confined solely to awaiting the arrival of competitors, and the afternoon should certainly not hang heavily on the hands of the visitors. During that period members of No. 66 (Fighter) Squadron from Duxford will give a display on their Gloster Gauntlets, while, at the invitation of the Royal Aero Club, Ober Lieut. Fischer and Herr Paul Förster, the crack Swiss and German pilots who recently delighted Lympne International Rallyists, will give aerobatic displays. Power-driven model aircraft will also be demonstrated.

Entrance to the public will be at the rate of 1s. per person, while entry to the special members' enclosure will cost 2s. 6d. Half a crown, also, is the car park charge.

Forthcoming Events

August 28-September 25. B.G.A. National Soaring Competition, Great Hucklow.
September 10-11. R.Ae.C.: King's Cup Race.
September 12. Lincolnshire Aero Club: At Home, Grimsby Airport, Waltham.
September 12. Flying Display, Rochester Airport.
September 18. North of Ireland Aero Club: Ulster Air Rally, Newtownards.
September 18. Eastbourne Flying Club: At Home.
September 23. Aero Golfing Society: Cellon Trophy.
September 25. South Coast Flying Club: Annual Dinner and Dance, Grand Hotel, Brighton.
October 6. R.Ae.S. (Weybridge Branch) Lecture: "Bird Flight," by Capt. J. Laurence Pritchard. Vickers Works, 6.15 p.m.
October 14. R.Ae.S. Lecture*: "The Hafner Gyroplane," by Mr. R. Hafner.
October 21. R.Ae.S. Lecture*: "Practical Airscrew Performance," by Mr. F. M. Thomas.
November 4. R.Ae.S. Lecture*: "Problems of High-Speed Flight as Affected by Compressibility," by Mr. C. N. H. Lock.
November 18. R.Ae.S. Lecture*: "The Take-off Problem," by Mr. H. F. Vessey.
December 2. R.Ae.S. Lecture*: "Wing Surface Controls with Reference to Possible Developments in Flying Technique," by Flt. Lt. H. P. Fraser.
December 16. R.Ae.S. Lecture*: "Development of Sailplanes," By Sqn. Ldr. G. M. Buxton.

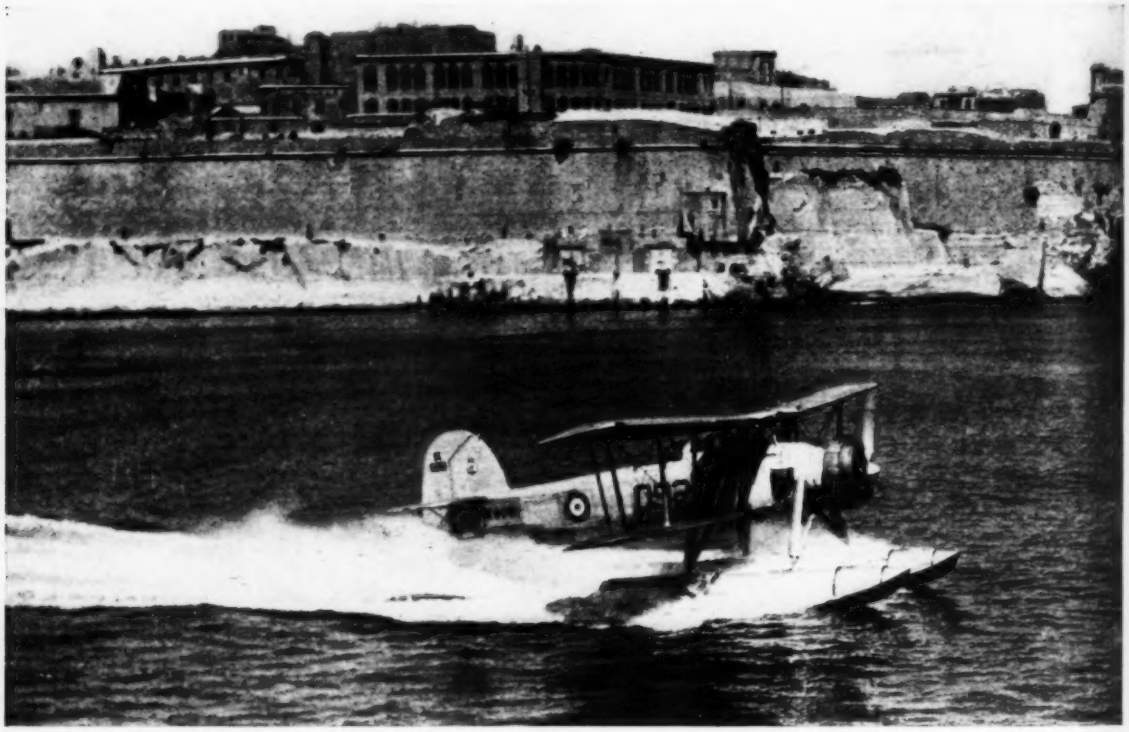
1938.

January 13. R.Ae.S. Lecture*: "Radio as a Direct Aid to Landing Approach," by Sqn. Ldr. R. S. Blucke.
January 27. R.Ae.S. Lecture*: "Electrical Ignition on Aero Engines," by Dr. G. E. Bairstow.
February 3. R.Ae.S. Lecture*: "Recent Research into the Aerodynamic Characteristics of Aircraft," by Mr. E. F. Relf.
February 17. R.Ae.S. Lecture*: "The Maintenance of Civil Aircraft," by Mr. H. L. Hall.

* All these lectures take place at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1, beginning at 6.30 p.m.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS



MALTESE CAMEO: A Fairey Swordfish torpedo spotter reconnaissance floatplane (690/750 h.p. Bristol Pegasus III) from the *Courageous* landing in Valetta Harbour, Malta.

CENTRAL FLYING SCHOOL

The undermentioned officers and airman pilots who attended the flying instructors' course at the Central Flying School from April 26 to July 10, have been categorised as under:—

A.2

Flt. Lt. R. V. Bucknall and F/O. P. H. Dunn.

B

Flt. Lts. R. V. Alexander, R. G. E. Catt, A. L. Christian, E. Foster, B. E. Lowe, G. J. Spence, L. V. Spencer, W. L. Stedman; F/O.s R. R. Gregory, P. C. Hilton, A. P. Hollick, F. M. Loudon, J. M. Southwell; H. M. W. Thomas-Ferrand, C. F. C. Wright; Flt. Sgts. Ashdown, C. E., Boyd, W. P., Drake, R. E., Law, J. R., O'Brien, O., Price, P. C.; Sgts. Abercromby, W., Appleby, A. F., Bradshaw, W., Harries, H. B., Harvey, H., Jeary, R. W., Lambert, L. C., Lillywhite, G. E., Macintosh, G. M., Roberts, G. F., Scivier, D. W.

C

Flt. Lts. H. I. Dabinett, G. H. Gatheral, A. E. Cairnes.

SPECIALIST SIGNALS COURSE

The undermentioned officers, having successfully completed the specialist signals course at the Electrical and Wireless School, Cranwell, which terminated on June 25, are granted the symbol "S":—

Flt. Lts. H. G. Blair, D. R. Evans, G. L. S. Griffith-Jones, P. H. Holmes, H. G. Leonard-Williams, C. C. Morton, M. K. D. Porter, A. G. Powell, P. R. Robinson, I. A. Scott, C. M. Stewart.

The undermentioned officers also successfully completed the course:—

F/O. W. A. Orr, Royal Canadian Air Force, Flt. Lt. A. G. Pither, Royal Australian Air Force.

The undermentioned officer has been selected to attend the "S" course at Cambridge University:—

Flt. Lt. G. L. S. Griffith-Jones.

No. 2 ROYAL AIR FORCE DEPOT

No. 2 Royal Air Force Depôt will now remain at Henlow until September 30, before moving to Cardington.

FLYING ACCIDENTS

The Air Ministry regrets to announce the following accidents:—

F/O. Thomas Norman Kenneth Walker lost his life as a result of a collision in the air which occurred at Duxford on August 30, between two aircraft of No. 66 (F) Squadron. F/O. Walker was the pilot and sole occupant of his aircraft. P/O. Patrick Browne, the pilot and sole occupant of the other aircraft, was uninjured.

P/O. William Herbert Cheetham, Sgt. John Medd and Corpl. Cecil George Gurd are reported missing in the sea as the result of a collision in the air which occurred at Skipsea Ranges on September 2, between two aircraft of No. 22 (Torpedo Bomber) Squadron, Donibristle, Fife. P/O. Cheetham and Sgt. Medd were the pilots of their respective aircraft and Corpl. Gurd was a passenger in one of the aircraft. A passenger of the other aircraft, A/C.1 Leslie Broadbent Wilson, was not injured.

Extensive search both from the air and by surface vessels has revealed no trace of the missing personnel. It must, therefore, be presumed, with regret, that the personnel reported as missing have lost their lives.

Sub-Lt. Charles Anthony Knocker, Royal Navy, Flying Officer, Royal Air Force, lost his life in an accident which occurred off the Isle of Wight on September 3 to an aircraft of the R.A.F. Station, Gosport, Hants. Sub-Lt. Knocker was the pilot and sole occupant of the aircraft.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore.—W. B. Callaway, A.F.C., to No. 5 (Bomber) Group, Mildenhall; on appointment as Air Officer Commanding, 17.8.37.

Wing Commanders.—J. MacG. Fairweather, D.F.C., to No. 8 Armament Training Camp, Evanton; to command, 16.8.37. E. G. Hilton, D.F.C., A.F.C., to Directorate Technical Development, Air Ministry; vice Wing Cdr. B. McEntegart, 17.8.37. B. McEntega.t, to Experimental Section, Royal Aircraft Establishment, South Farnborough; for flying duties, 17.8.37. J. W. Jones, to Directorate of Intelligence, Air Ministry, 23.8.37. K. H. R. Elliot, D.S.O., to No. 51 (Bomber) Squadron, Boscombe Down; to command, 23.8.37.

Squadron Leaders.—B. H. C. Russell, to Deputy Directorate War Organisation Dept., Air Ministry, 18.8.37. M. Wiblin, to R.A.F. Station, Cranwell; for Administrative duties, 21.8.37. O. R. Pigott, to Headquarters, Armament Group, Eastchurch; for Air Staff duties, 20.8.37. J. H. McN. Campbell, to Headquarters, No. 4 (Bomber) Group, Linton-upon-Ouse; for Navigation duties, 20.8.37. G. I. L. Saye, A.F.C., to Headquarters, No. 1 (Bomber) Group, Abingdon; for Navigation duties, 14.8.37. A. M. Stevens, to No. 27 (Bomber) Squadron, Kohat, India; to command, 4.8.37. E. B. Steedman, to No. 10 (Bomber) Squadron, Dishforth; for flying duties, 23.8.37. V. Q. Blackden, to Headquarters, No. 5 (Bomber) Group, Mildenhall; for duty as Senior Personnel Staff Officer, 18.8.37.

Flight Lieutenants.—R. T. Cazalet, to Air Armament School, Eastchurch, 12.8.37. D. J. P. Lee, to Superintendent of the Reserve, Hendon, 14.8.37. R. H. A. Leigh, to Central Flying School, Upavon, 16.8.37. A. E. Louks, to D.D.R.M., Air Ministry, 16.8.37. A. T. Monks, to Air Ministry W/T Section, London, 16.8.37. G. R. Montgomery, to Headquarters, R.A.F. Middle East, Cairo, Egypt, 26.7.37. J. R. Scarlett, to Headquarters, No. 17 (Training) Group, Lee-on-the-Solent, 19.8.37. J. Coverdale, to Headquarters, No. 1 (Bomber) Group, Abingdon, 21.8.37. G. D. M. Blackwood, to No. 6 Flying Training School, Netheravon, 23.8.37. D. S. Radford, to No. 600 (City of London) (Fighter) Squadron, Hendon, 23.8.37. L. G. Belchem, to H.M.S. *Courageous*, 18.8.37. A. C. Martin, to Home Aircraft Depot, Henlow, 19.8.37. L. J. Crosbie, to No. 111 (Fighter) Squadron, Northolt, 13.8.37.

Flying Officers.—B. G. Morris, to No. 7 Flying Training School, Peterborough, 16.8.37. E. J. Boyle, to No. 26 (Army Co-operation) Squadron, Catterick, 20.8.37. T. Adam and G. F. Watson-Smyth, to No. 13 (Army Co-operation) Squadron, Odiham, 15.8.37. B. B. St. G. Daly, to No. 53 (Army Co-operation) Squadron, South Farnborough, 15.8.37. N. B. Hallmark, J. C. T. Gardner, and M. J. Muspratt-Williams, to No. 59 (Army Co-operation) Squadron, Old Sarum, 15.8.37 P. Ruston, to No. 9 Flying Training School, Hullavington, 16.8.37.

Pilot Officers.—J. B. Wray, to No. 53 (Army Co-operation) Squadron, South Farnborough, 20.8.37. S. E. A. Brown and M. I. Murdock, to No. 59 (Army Co-operation) Squadron, Old Sarum, 20.8.37. P. C. Pinkham, to R.A.F. Station, Mildenhall, 16.8.37. R. N. Keeble, to No. 113 (Bomber) Squadron, Upper Heyford, 9.8.37 K. B. F. Smith, to No. 58 (Bomber) Squadron, Boscombe Down, 6.8.37. J. A. C. Karran, to No. 820 (Torpedo Spotter Reconnaissance) Squadron, 24.8.37. N. M. Thomas, to No. 3 Armament Training Camp, Sutton Bridge, 18.8.37.

Acting Pilot Officers.—C. A. Harris, to No. 53 (Army Co-operation) Squadron, South Farnborough, 20.8.37. J. Jefferies, to No. 17 (Fighter) Squadron, Whyteleafe, 7.8.37. T. E. Gray and H. R. Hamilton, to No. 46 (Fighter) Squadron, Whyteleafe, 7.8.37. R. V. Jeff, to No. 87 (Fighter) Squadron, Debden, 7.8.37. N. Orton, to No. 73 (Fighter) Squadron, Debden, 7.8.37. J. C. Hunter, to No. 105 (Bomber) Squadron, Harwell, 7.8.37. G. A. Thompson, to No. 12 (Bomber) Squadron, Andover, 7.8.37. N. G. Birks, to No. 35 (Bomber) Squadron, Worthy Down, 7.8.37. D. A. Smith, to No. 104 (Bomber) Squadron, Hucknall, 7.8.37. J. R. Cree, G. T. Palmer, and T. A. Cox, to No. 90 (Bomber) Squadron, Bicester, 7.8.37. C. K. G. Bushe, to No. 63 (Bomber) Squadron, Upwood, 7.8.37. P. S. Touchbourne and F. B. Harris, to No. 38 (Bomber) Squadron, Marham, 7.8.37. T. W. La B. Bamford, R. J. Miles, J. P. C. Rolt, J. R. T. Smalley, R. Thompson, and C. R. C. Howlett, to No. 9 (Bomber) Squadron, Scampton, 7.8.37. A. T. Thompson and P. C. Lemon, to No. 37 (Bomber) Squadron, Feltwell, 7.8.37. P. L. Billing, to No. 269 (General Reconnaissance) Squadron, Abbotsinch, 7.8.37. P. C. Rolt, G. D. O. le M. Hutchesson, H. G. D. Devey, E. A. Good, and J. F. Ross, to No. 206 (General Reconnaissance) Squadron, Bircham Newton, 7.8.37.

Equipment Branch

Squadron Leader.—R. M. Thomas, to Headquarters, Bomber Command; for Equipment Staff duties, 16.8.37.

Accountant Branch

Flying Officers.—The undermentioned are posted to the units shown on the date indicated, on appointment to permanent commissions, on probation with effect from the dates shown:—E. G. Parry, to Aircraft Depot, Iraq, Hinaidi, 7.7.37. F. V. M. Rich, to R.A.F. Station. Grantham, 31.7.37. A. F. B. Waller, to R.A.F. Station, Digby, 2.8.37.

Medical Branch

Flight Lieutenants.—D. W. I. Thomas, to No. 8 Armament Training Camp, Evanton, 16.8.37. R. A. Cumming, to R.A.F. General Hospital, Iraq, Hinaidi, 26.7.37.

Commissioned Engineer Officers

Flying Officers.—The undermentioned are posted to the units shown, on appointment to permanent commissions, on probation, with effect from 29.7.37:—H. L. Millyard, to R.A.F. Station, North Coates Fitties. H. O. B. Mawdsley, to No. 9 Flying Training School, Hullavington. E. R. Paley, to R.A.F. Station, Bircham Newton. W. J. S. Barnard, to R.A.F. Station, Waddington. L. G. Hucker, to R.A.F. Station, Debden. M. W. Moore, to No. 7 Flying Training School, Peterborough. B. A. Vautier, to No. 10 Flying Training School, Tern Hill. R. D. Gough, to R.A.F. Station, Worthy Down. L. Davey, to R.A.F. Station, Honington. W. Moore, to No. 1 School of Technical Training (Apprentices), Halton.

Commissioned Signals Officers

Flying Officers.—W. M. E. Cannock, to D.D.R.M., Air Ministry, 16.8.37.

The undermentioned are posted to the units shown on appointment to permanent commissions, on probation, with effect from 29.7.37:—J. Lindsay, to R.A.F. Station, Boscombe Down. H. J. Maxted, to Electrical and Wireless School, Cranwell. J. Woods, to R.A.F. Station, Aldergrove. J. A. C. Pride, to R.A.F. Station, Scampton. D. McLaren to R.A.F. Station, Northolt.

Commissioned Photography Officers

Flying Officer.—A. E. L. Worster, to Headquarters No. 17 (Training) Group, Lee-on-the-Solent, on appointment to a permanent commission, on probation, 29.7.37.

Medical Branch

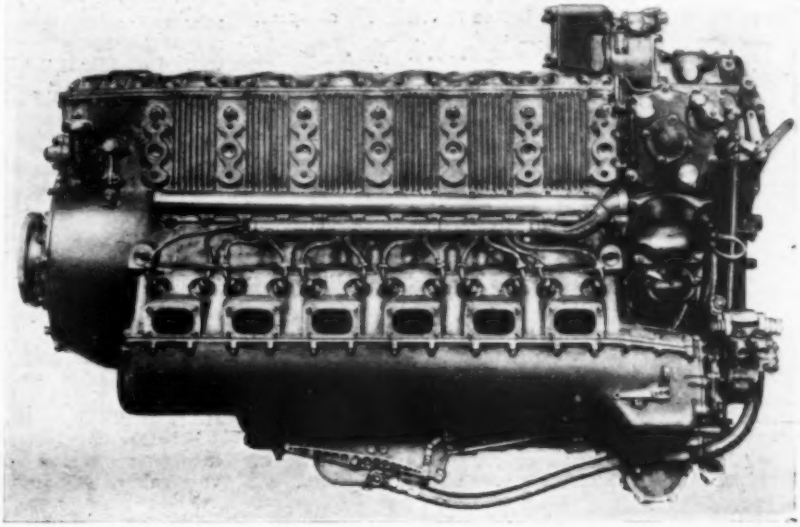
Wing Commander.—G. P. O'Connell, to R.A.F. Depot, Uxbridge; for duty as Medical Officer, 16.8.37.

Chaplains Branch

Revd. J. N. Keeling, to R.A.F. Station, Gosport; for duty as Chaplain (C. of E.), 17.8.37.

A NEW GERMAN INVERTED VEE

At the recent international meeting at Zürich several of the successful German machines were fitted with the new Junkers 210 petrol engine. This is the latest product of the Junkers Flugzeug-und-Motorenwerke of Dessau, and is an inverted 60 deg. vee twelve, designed to run on petrol of 87 octane (C.F.R.) number. The engine is of very small frontal area and lends itself to very "clean" installation in the aeroplane. The main dimensions are: length, 1,478 mm.; height, 960 mm.; width, 686 mm. The dry weight is 442 kg. (952 lb.) and the power at ground level is 680 b.h.p. at 2,700 r.p.m. for the naturally aspirated model. There is also a supercharged version, with a rated altitude of 15,000 ft. This has a maximum power of 640 b.h.p. and is fitted with automatic boost control. Three valves per cylinder are provided, two inlets and one exhaust, operated by push rods and rockers from a single camshaft.



PRIVATE FLYING

MAJOR-POWERED MINOR. The diminutive Hobby single-seater sports monoplane which will be the mount of its designer—Mr. F. G. Miles—in the King's Cup Race. It has one of the new Gipsy Major II engines. (*Flight* photograph.)

Topics of the Day

All Experience

AS a direct result, perhaps, of good training, of a natural leaning towards fussy accuracy, or a liking for simple mathematical problems, I have always worked out my flying courses meticulously. As my patient readers may have gathered, I have already retrogressed to the extent of being no longer contemptuous of railway lines in certain circumstances. Last week, I regret to say, I took another step backwards and made a long series of cross-country flights without once using a C.D.C. for anything more than an occasional ground-speed check by means of the proportional calculator.

In all, I flew on nineteen different tracks in weather which was, for the most part, poor and occasionally even frightening and in winds which varied all round the compass and up or down the Beaufort scale. The drift allowances were all guessed, with at least one check at the end of twenty miles on every long track, yet (though I says it as shouldn't) I hit every terminal point spot-on in anything from 800 yards to 20 miles' visibility.

Having shot my little line, I now state categorically that without all the careful calculations of previous years my guesses would have been hopelessly inaccurate and my rechecks unlimited in number. Not for a moment do I regret the hundreds of vector diagrams that have been either drawn or mechanically reproduced by means of one type of C.D.C. or another. Nor do I regret even the period during which I actually went to the trouble of calculating "off-course-ness" in the air before resetting the compass.

Assisted Guesswork

THE fact that Mr. X. (who has flown the early morning newspapers to Paris in all sorts of weather during the last six months) makes no use of either map or calculating machine on his regular passages does not mean that maps or C.D.C.s are a waste of time, but merely that he knows every inch of the ground (when it is to be seen) and that he has developed a sort of supernatural guessing power.

The old-time bank clerk, who could add up three columns of figures together with almost instantaneous rapidity, never knew *how* he did it. A certain sequence of hieroglyphics, when these had been looked at by him in different formations for twenty years, simply meant a total of £2,654 3s. 2d., or of 18s. 7d. as the case may be, and that is all there is to it. In the same way, the hieroglyphics of a different shape in this paragraph, when glanced at by one or other of the aforementioned patient readers, instantaneously convey a picture of an elderly man who, seated on a high stool, is running a pen up a line of figures in a ledger. Or perhaps they convey another picture of "Indicator" being a crashing bore about navigation.

However, those who are too lazy to learn to use a C.D.C. will find endless amusement in handling a straightforward proportional calculator, some of the many uses of which were outlined on this page a few months ago during one of my kindergarten moments. Last week I learnt of yet another use—that of estimating the approximate drift allowance. The idea was discovered, I believe, by Heston's Capt. Ferguson, who markets his own miniature calculator with a useful instruction leaflet for the uninitiated.

For this drift estimation the arrow is placed against the figure of the machine's cruising speed, and the drift angle for a full beam wind is read off on the inner scale against the appropriate wind speed figure on the outer scale. If the wind direction is at 45 deg. to the track the angle given must obviously be halved; if at 30 deg. it must be divided by three; and so on. Which way the allowance must be made is a matter for commonsense.

The results are accurate enough for all practical purposes through reasonable wind and flying speed ranges, and are probably more accurate than one's initial information concerning upper-wind speed and direction. On consideration I should say that, once a novice has passed the vector-drawing-lesson stage, this method might be a useful one, since he or she would be forced to think the thing out each time; it is possible to work a C.D.C. quite automatically and without in the least understanding what is going on. Which reminds me of the latest Service model—a most complicated device, covered with cursors, scales, levers, releases, and what not. No one could possibly see the simple foundation problems in this, and it weighs about a ton. I wonder if the Farnborough people themselves have ever tried to use it in the air!

Subsidies

AFTER a good many premature statements in various quarters, the new subsidy scheme appears now to have been officially propagated to the clubs. This will have been a welcome matter to some of the less mighty clubs and schools, who, with the rest, have been waiting patiently to hear the best or the worst since April 1, when the old scheme went out of action.

The maximum sum payable in one year is now £2,000 (instead of £1,500, made up of £1,200 at full and £300 at half rates). A sum of £25 is paid for every "A" or "B" licence obtained, and £10 for every one renewed. Most interesting of all is the actual flying grant, which is 10s. an hour up to a maximum of £10 a year for every member. All of which, of course, is included in the maximum sum.

How the new system will work remains to be seen, but it is obvious that it will help those clubs with a small but very enthusiastic membership. INDICATOR.

FROM the CLUBS and SCHOOLS

CAMBRIDGE

TWO trips were made to Birmingham by the Puss Moth, and the Monospar was flown to St. Inglevert. Mr. Stewart completed the tests for his "A" licence and a total of 67 hr. 45 min. flying was logged for the week.

ISLE OF WIGHT

Mr. A. C. Klein has taken over the position of club instructor in place of Mr. R. K. Coupland, who left early in August. Flying times improved last month by nine hours.

LONDON

The flying time for the week ended September 4 was 124 hr. 40 min. Messrs. P. R. Tabor and G. S. Phillpotts made their first solo flights, and Mr. C. H. Nordenskoild completed his "A" licence tests. There was a further increase in membership.

LINCOLNSHIRE

An At Home, opening with an afternoon patrol and arrival competition, was due to be held at Waltham aerodrome (Grimsby) last Sunday. Mr. Hipkin has taken his "A" licence, and new members include Messrs. Phillips, Aitken and Dawson.

WITNEY AND OXFORD

Mr. P. W. M. Mallorie, a pupil of the Witney Aeronautical College, has obtained his W/T operator's licence. A total of 30 hours' flying was achieved for the week ended September 4, with a grand total of 125 hours for the month of August.

NEWCASTLE

A total of 45 hours were flown during the week with cross-country flights to Renfrew and Carlisle. Mr. H. A. Stafford made his first solo. Visitors have included several King's Cup competitors and it is hoped that they were equally impressed at other controls!

NORTHAMPTON

The flying carried out at Sywell during the month of August totalled 70 hours, including a number of cross-country flights made by members to such places as the Isle of Wight and Cardiff. Six new members were welcomed.

REDHILL

The Puss Moth made a trip to Ostend, whilst three other machines put in appearance at the Lympne Rally. Messrs. I. Harvey and A. J. Mulder have been concentrating on night flying and completed this part of their "B" licence tests. A total of 83 hr. 30 min. was recorded for the fortnight ended September 3.

MIDLAND

Successful first solo flights were made by Miss M. Ellison and Messrs. R. Hill and J. Duerdon. A total of 33 hr. 45 min. flying was made during the week ended September 3, with cross-country flights to Tollerton and Desford. Two new flying members have put in an appearance.

HULL

Morning and evening mists and high winds have made August a poor flying month, only 79 hr. 15 min. having been spent in the air. Messrs. Short and Sievewright carried out first solo flights and Dr. Upton-Jones qualified for her "A" licence. Three new flying members joined during the month.

HANWORTH

A visit was made to this club by Col. Smith Barry, chief instructor to the first flying school in England. Mr. H. McClelland, one of the club's oldest members, although not in age, has returned from France with a new acquisition of great interest. We can only assume that this is an aeroplane. Mr. R. Tand completed "A" licence tests and total flying times were 109 hr. 50 min.

YORK AND LEEMING

The work of extension and drainage for the enlargement of the landing area has started at York aerodrome. Taxi trips and cross-country flights have been made to Lympne, Hatfield and Biarritz. A total of 232 hr. 55 min. flying was put up during the month of August. Dr. Kerslake made a first solo and Mr. Ford succeeded in obtaining his "A" licence.

BORDER

Among the various visitors by air during last week were F/O. Hughesdon and Mr. Giles Guthrie in two Leopard Moths, each of whom were flying round the King's Cup course. On Saturday last Railway Air Services ran two D.H.89s and one D.H.86, and on Sunday one D.H.89 and one D.H.86 on the 1 p.m. service from Carlisle to the Isle of Man.

YAPTON

Three club machines attacked Portsmouth airport at dawn on September 5, and one was fortunate enough to obtain a free breakfast. Cross-country flights to Gatwick, Hanworth and Southampton helped to swell the flying total to 54 hr. 30 min. The total for August was 232 hours. First solos were made by Messrs. G. C. Davis, J. G. May, and A. L. Pellegrini.

STRATHTAY

Flying has been restricted at Perth by fog, rain and wind, the total for the week to August 31 being only 13½ hours. During the month 71 hours were logged. It was mentioned in last week's issue of *Flight* that Miss E. L. Corke had joined the Strathtay Aero Club as a pilot member. We are now told that her name is Mrs. E. C. Corke.

BROOKLANDS

A novel petrol-driven model aeroplane competition was held at Brooklands on Sunday last, when some surprising performances were put up. Ten machines took part in the Portsmouth Dawn Patrol, three of them obtaining the appropriate bacon and eggs. The flying times for the fortnight amount to 203 hours. "A" licence tests were completed by Messrs. Bamberger, Kidner, and Pearson, and Mr. Kuipers made a first solo. Brooklands have added five Tiger Moth aircraft to their fleet since February.

CINQUE PORTS

The club is slowly returning to normal after the Rally. To make matters worse for the mopping-up parties the club has had one of the busiest weeks on record; on Saturday and Sunday alone over 46 hours dual and solo were recorded, while the total hours for the week were 96. Another Cirrus Minor Swallow has come into commission on the club fleet. Amongst visitors was Flt. Lt. Barringer, who brought a Vega Gull for demonstration, and Miss Schmidt arrived to clear Customs in a towed glider on her way back to Germany from Dunstable. There have been two successful "B" licence night flights performed by Messrs. Field Richards and Michelson, and Mr. R. A. Hernu made his first solo. Flt. Lt. David Llewellyn has joined the instructional staff at Lympne.

Eastbourne and Rochester

THE indefatigable Capt. Short tells us that his previous big list of aircraft acceptances for the Eastbourne Club's At Home, postponed from August 14 on account of the weather, looks like being equalled on the new date, which is September 18. The arrival competition is from 12.30 to 2.30.

Capt. Short is also acting as hon. organiser of the meeting which, next Sunday, September 12, will conclude Rochester Airport's annual Air Week. There is an arrival competition (12.15-1.15) with a £5 cash prize, and there will be aircraft demonstrations, a parachute descent, and other items.

Competitions at Hatfield

THE first two of the four competitions now run every year by the London Aeroplane Club were flown off on August 29 and on last Sunday. These were, respectively, for map-reading and navigation.

Entrants in the former were given maps in a sealed envelope which had not to be opened until the machine had left the ground. Tracks had already been drawn, but the compass had been covered with paint, which could, of course, be rubbed off in case of emergency. The times were calculated on an air speed of 90 m.p.h for Tigers and 100 m.p.h. for Hornets, and the winner was the pilot whose total error at the turning points and at the aerodrome was the least. The results were: 1, H. K. Cartwright (6½ min. error); 2, O. Morrogh-Ryan (8½ min. error); 3, Miss R. K. Everard (20 min. error).

Somewhat similar conditions were imposed for the navigation competition, though in this case the compass could be used and time was allowed for the calculation of courses. However, the map provided showed only areas within eight-mile radii of Hatfield and of each turning point, but a complete map was carried in a sealed envelope for use in emergency. The results in this competition were: 1, D. E. Henderson (2¼ min. error); 2, O. Morrogh-Ryan (5½ min. error); 3, H. K. Cartwright (9½ min. error).

The next two events, for aerobatics and forced landings, will be run on Saturday, September 18. In the former competitors will be judged on their capacity to perform accurate spins, loops, half-rolls, stalled turns, half-roll-off-loops, and slow rolls; five minutes extra will be allowed for the competitors' own ideas—bunts and flick rolls, sensibly enough, being *verboten*. For the forced-landing event entrants will be required to make an engine-off approach from 1,500ft. and to land between two marks, the pilot whose machine stops nearest to the second of these being the winner.

Affinities

SIR MALCOLM CAMPBELL'S craft which, on September 2, raised the motor boat speed record to 129.5 m.p.h., has some interesting affinities with aviation. It was built by Saunders-Roe, Ltd., largely of Saro plywood doped with Cellon, and the engine is a Rolls-Royce "R." The plugs were K.L.G.s, the magnetos B.T.H., the fuel Esso, and the oil Castrol. Other items with an aeronautical flavour were Arens controls, Smith's instruments, and a propeller of Firth's steel.

Private Flying

SOUTHEND SOCIABILITY

Mr. Waight takes the D.H. Comet across the aerodrome at low altitude. (*Flight* photograph.)

WERE we to believe all the libellous remarks about Southend, which, mainly because the tide goes out a long way, has always been the butt of comedians and newspaper humorists, we should expect an airport and a flying club to be the last thing it possessed. But it does posses them, and very nice they are, too. Since the airport was established in March, 1935, the membership of the Club (which was actually founded six years before that, at the old pony racecourse at Rochford) has grown from 200 to 400, and there are sixty "A" licence pilots on the books. Mr. Lynton Blow, the chief instructor, is turning them out at the rate of one a week.

Last Saturday's At Home—the Club's fifth annual aerodrome party—was a pleasantly informal little show, and all the better for that. The aerodrome looked its best, with gay flowers in front of the club-house and the landing field stretching away in one of the most beautifully mown expanses we have ever seen—though the mower had not removed one useful bump, which received us, so to speak, with open arms, and the Editorial equanimity was not fully restored until the four Demons of No. 601 (County of London) Fighter Squadron found it, too. The Demons were escorting the D.H. Dragonfly which brought Sir Philip Sassoon. Some people, remembering that Sir Philip is now First Commissioner of Works, wondered at the warlike escort, but the explanation is that the former Under-Secretary for Air is still Honorary Air Commodore of No. 601.

The flying programme which followed was mainly a light-hearted affair. Mr. Donald Rankin put across a polished, leisurely display in a Cadet—the very antithesis of the yank-bank-quick-flick aerobatic school; Mr. Stanley Waters and Miss Rozelle won the bombing competition, Cadet *v.* fire engine, using the self-raising, or Miller's, bomb usually favoured for this type of warfare; Mr. Alex. Petty scored top marks in the balloon-bursting competition; and Mr. F. L. Campion was victor in an obstacle race, a most ambitious affair which involved a final lap on a donkey.

More seriously, Mr. Alex. Henshaw, *avec père*, won the arrival competition in a Leopard Moth; Mr. Brie demonstrated the Autogiro; Mr. Castlemaine the S.T.25 Monospar; and Mr. Appi the Taylor Cub. Mr. Charles Allen won the concours d'élégance with his Leopard Moth, and Mr. Gwynne Johns delighted the multitude with a parachute descent.

Something quite out of the ordinary in the way of visiting aircraft was the De Havilland Comet, still with its Damascus Race numbers, which Mr. R. J. Waight brought over from Gravesend. Flown low and fast over the enclosure, it provided a most exhilarating spectacle. By contrast easily the smallest visitor, and one which has not previously been encountered at meetings, was the charming little Chilton monoplane, lately fledged at Hungerford, Berks. Being, to all intents and purposes, without a compass, Mr. A. R. Ward, its co-designer, followed us over from Hatfield, and the little single-seater cruised comfortably with us at a pre-arranged ninety, in spite of the fact that the cooling installation of the 40 h.p. Carden engine was not yet quite right.

It was left to No. 601 Squadron's Demons to provide the real high spot of the afternoon. No flight aerobatics for them; instead, they spent five minutes making a positively nerve-shattering converging attack on the club-house enclosure. One had the impression of a bewildering number of extremely large, noisy and fast aeroplanes appearing at all sorts of angles through back-entrances, and when two of them crossed paths with, apparently, a bare twenty yards to spare, one well-known pilot was rumoured to have taken refuge under a deck chair, emitting faint whinnying noises.

And after that, in the evening, there was dancing on the lawn, and a cabaret show and, next morning, a cocktail party. Which sounds like poetic justice.

COMPETENCY REWARDED: His Excellency the Governor of Sind, at Karachi Airport, presents the Willingdon Trophy to Mr. P. D. Sharma, of Indian National Airways. The trophy is awarded annually to the Indian pilot with the best flying record of the year.

Pedigree Parachute

MR. BENNO G. DE GREEUW, who has been a consistently popular parachute performer at flying displays up and down the country for quite a number of years now, mentions something interesting about the 26ft. 'chute which he habitually uses. It is nearly five years old, was the G.Q. Company's fifteenth to be produced, and was actually made in January, 1933, for the Houston-Everest Expedition. As he remarks, "not bad going for an old Jap silk 'chute (British silk is now employed)"—which remark does *not* imply that its serviceability is in any way inferior to the foreign article.

Aero Engineering Classes

A BROCHURE issued by the Northampton Polytechnic (St. John Street, London, E.C.1) gives details of the 1937-1938 evening classes in engineering, which include aeronautical engineering; the course is intended to prepare students for the Fellowship examination of the R.Ae.S. Capt. C. H. Latimer-Needham, whose name will be familiar to many readers of *Flight*, is among the lecturers.

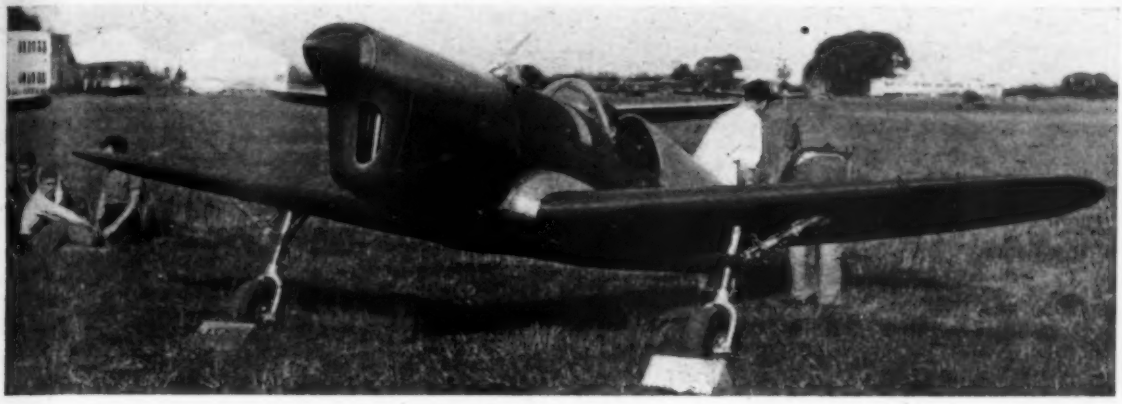
NEXT WEEK

NEXT week's issue of *Flight* will be a Special Number containing a detailed and fully illustrated report of the King's Cup Race, together with other features of unusual interest.

THURSDAY NEXT — FLIGHT — SEPTEMBER SIXTEENTH

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS



WOODWORK AS A HOBBY: Mr. F. G. Miles' own pet entry for the King's Cup race. Christened the Hobby, it is powered with one of the new Series II Gipsy Majors driving a "1,000" size D.H. v.p. airscrew. Unorthodox features of this fascinating little wooden racer are the wide track and the short span, which is actually less than the length. (*Flight* photograph.)

ANTI-AIRCRAFT demonstrations are to be given at the White City and Harringay greyhound-racing stadiums on October 9 and 15 respectively.

Members of the Anglo-German Gliding Camp, who have been spending a fortnight at Dunstable, were entertained at the Park Lane Hotel last Monday by the Royal Aero Club.

Extract from American contemporary: "Dick Merrill's transatlantic taxi has been parked at Union Air Terminal while Merrill and Jack Lambie are fulfilling a movie contract in Hollywood. . . Between shooting dates Merrill had his engines given a top in the P.A.C. shops."

Preliminary data on the new semi-secret two-row Wright Cyclone are: Take-off output 1,500 h.p. at 2,300 r.p.m. on 95-octane fuel, bore and stroke 6.125 by 6.312in., displacement 2,603 cu. in., compression ratio 6.85 : 1, and weight 1,875 lb. The designation of the engine is GR-2600A-2.

Twenty-five Years Ago

(From "Flight" of September 7, 1912.)

"Incidental to the demonstration of the advantage of the Avro enclosed body was an interesting and unique flight from Salisbury Plain to Upavon during which H. V. Roe, who was the passenger with Lieut. Parke, took a Monarch typewriter with him and typed very clearly particulars of the machine and a note on his impressions during the journey in mid-air."

U.S. PILOTS GET TOGETHER: A trio of Grumman fighters from an American aircraft-carrier dress by the left during manœuvres. These Grummans have 700 h.p. Pratt and Whitney Twin Wasp Junior engines and are the fastest machines of their class in service.

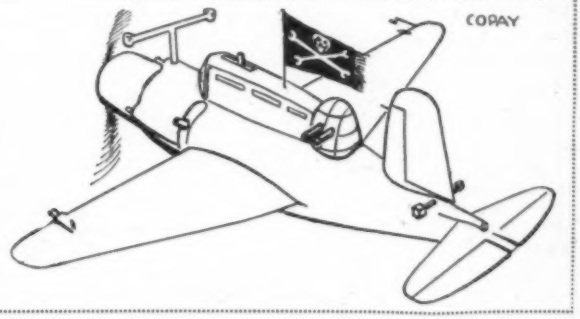
Lee Miles, who has met with considerable success in American national air races, was killed when a wing came off a racing machine he was testing at Cleveland last week.

A memorial plaque to the late Sir Sir Charles Kingsford Smith, who disappeared while flying from England to Australia in 1935, has been unveiled at Auckland Museum by his widow.

THE UNKIND UNTRUTH

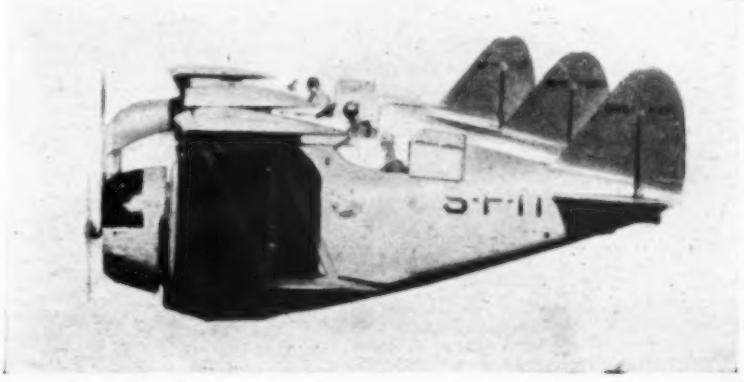
(with apologies in all directions)

No. 4. The Blackburn Brigand



Flight regrets to record the death of Herr Karl Schwabe, the German airman who made three fine flights to Africa and who went to the rescue of Mr. Guy Robson during the 1933 Sahara race. Herr Schwabe crashed into the Baltic during Reserve manœuvres.

General Goering has said: "Just as mighty and strong warships cross the ocean to give greetings of your homeland, so the time is no longer far away when I shall send my squadrons to friendly lands and nations from the homeland for greetings abroad."



COMMERCIAL AVIATION

MODERN AIRPORT: A view of the terminal building—reminiscent in general appearance of that at the unlucky Gatwick—of the new Budapest Airport taken on the day before the official opening, with M. Budaör's Bücker Jungmann in the foreground. The building must be one of the most beautifully arranged and decorated at any airport in the world.

THE WEEK AT CROYDON

Flooded Out! : K.L.M. Manager Honoured : Full Loads : The Energetic "Balpa" : Gadgetry

WELL, I'b an awval cod in by dose, bud I bromised by vriend "A. Viador" dat I'd keeb his zix readers (an my own faidful seven) aquainded wid Croydon's goigs-on wile he iz 'oliday baking wid Ella Vator and deir yongster Dee Viator—all gone vossil-hunding (you zow—'mong old Roban dykes an' diggings) an' libing on muzrooms an' muzzles, coz I underzdand dey're by de zeazide! Well, I bust just bention and abologise vor by cod in by dose, bud I feld I bust—howeber gread de ingodvenienze do all codzerned—explain dat I god by cod in by dose during de gread storb lazd weeg! An dow I'b sbeachlez!—because if I'm not soon speechless, the printers will be downing tools or whatever they use.

As I mentioned, my nasal infection was obtained in the course of securing exclusive pictures with my "Point-and-Hope No. 0," of the new Croydon Seaplane Base, an amphibious Air France air liner, and investigating the new floating hangars—erected with unprecedented promptitude and foresight by our friends Quirks and Guildings—on the site of the very old hangars on the north side of the alighting area, known officially and most appropriately as "C" hangars.

Soak-Away

I am told that the C.A.O. and his engineers have given up all hope of bringing to a satisfactory conclusion the negotiations for passing the Airport's surplus surface water to the swimming pool, that an indent has been made for a "Barge, High-speed, Captain's, use of, one," for airline crews, and that keen competition has developed between Surreys and Olleys for the tenancy of the new soak-away situate to the east of their hangar, for the profitable conversion of same into an asparagus or marrow bed. A low-tide examination, made two days after the storm, revealed that this soak-away is likely to exceed the expectations of prospective tenants in the matter of fertility. Bidding has been quite high, but it has not yet been ascertained whether the produce so raised will be the property of the tenants or the S-of-S for A.

One of the most cheering news items of the week is the signal honour done to Capt. H. Spry Leverton, the K.L.M. Croydon Manager, on whom Her Majesty the Queen of Holland has conferred the Knight Order Oranjenassau for his services to Dutch aviation, and (we of Croydon know) of aviation in general. This Order corresponds to our knighthood, and Capt. Leverton is, I understand, the first Englishman to be thus honoured.

Capt. Leverton—or "Spry" to a wide circle of friends—has presided over K.L.M. interests in this country for seventeen years. Before that he was with A.T. and T. in the days when one squeezed four (or was it two?) mortals into a machine, chucked as much luggage on top of them as their size and feelings would allow—with the life-belts on top, just to be law-abiding and stop them bouncing—and finally slammed home the roof. "Spry" is therefore a true pioneer, and his many friends here heartily congratulate him and wish him many more years of service.

They say that one's misfortunes are another's fortune, and in this instance no fewer than five ambulance cases were the lot of Olley Air Service this week. Mr. Carter will be missed here as he is moving north to look after that company's increasing interests in the Isle of Man area. His place as traffic manager is taken by Mr. Eskell, well known by reason of his connection with Sir Alan Cobham's circus and with one of the Croydon companies before that. Strange how folk seem to migrate back to Croydon.

A good sign from British Airways is that they are expecting another Electra. They certainly need it as they are running well up to capacity. I hear that the Electras are proving very economical, and I notice that their skippers have quickly grasped their technique; their undercarts are up well inside the airport boundary these days. Air Dispatch—the pilots at any rate—are recuperating from their strenuous co-operation flying, which is now concluded. Even so, I hear that Capt. Scott has hired himself per Rapide to Denmark for a nice fortnight's work.

"Balpa," the pilots' own organisation, seems to be less prominent these days, but enquiries elicit the information that it is "getting along nicely, thank you." A circular letter from them to operators suggests "grave concern" that aircraft operating regular services are not all fitted with horizons, sensitive altimeters, gyros and radio. All very desirable. But is it realised that to make the foregoing compulsory would cause the operator to be liable for anything between £300 and £500 per aircraft, according to

whether he rents or purchases his radio? In the case of the smaller airlines, or of an operator prospecting a particular route, this seems a big outlay, which might not be justified.

It seems fairly patent that an operator, as his routes and traffic develop, will have to call upon these aids to ensure regularity in this climate of ours, but there is a vast difference twixt "desirability" and "compulsory." Most professional pilots would, I believe, prefer to see "Balpa" directing its undoubted influence to widening the scope of the present "B" licence curriculum to encompass the uses of such equipment, and so obviating the "dead end" at which the new holder of a "B" licence inevitably finds himself—unless he has other qualifications immediately to position himself for a job. Or, do we need another and higher category in the licensing of pilots? That, I fear, is too controversial a subject for these notes. But we may see! Some day our aircraft constructors will design a machine in which we can put all this (essential) gadgetry.

T. A. R. MAC.

First Class Navigation

SOME time ago it was stated that a course for First Class Navigators' Licences would shortly begin at the Imperial School of Navigation. The day course is due to begin at the end of this month in preparation for examination next March. Twice-weekly evening classes for the Second Class Navigators' examination will be re-opened at the same time. Incidentally, a revised edition of *Martin's Air Navigation* is now ready.

G.E.'s Licences

EXAMINATION boards for the purpose of examining applicants for G.E.'s licences will sit in London on each Tuesday in October, November and December; at Croydon on the second Thursday in each of the same months; in Liverpool on the third Thursday in December; and in Glasgow on the third Thursday in November. Applications should be made on C.A. Form 2B and addressed to the Secretary, Air Ministry (C.A.3 (a)), Ariel House, Strand, London, W.C.2.

Western Terminal

DURING the past few months the Marconi-Adcock D/F system, installed at Bristol's airport to replace the original equipment, has been in action, and a fortnight ago experiments were made with a mobile version of the Lorenz beacon. One of Farnborough's blind-approach Monospars came down to carry out the tests and it seems possible that in due course Whitchurch will have its blind-approach system.

It remains to be seen whether work will shortly be started on the new terminal building which has long been planned at the north-eastern end of the landing area. For the moment, Capt. Winters, the manager, must carry on as well as he can in the temporary building which has, nevertheless, been in use for some years. From this it is not possible to obtain a full view of the landing area, and work is occasionally interrupted by the clatter of a teleprinter for which special office space is not at present available. Presumably the club building will remain where it is whatever changes are made. It is a little too permanent and well-laid-out to merit "uprootion."

Incidentally, the projected blind-approach line runs east and west over level country. Since the directional indications of ultra-short-wave equipment are extremely definite and accurate, there should be no possible chance of meeting Dundry Hill instead of the airport, though care will be necessary while making a second round in poor conditions. The comparative prosperity of the Irish service, which calls at Bristol on its way to Dublin, has made this development still more necessary.

America—New Zealand

AFTER two more survey flights it appears probable that the P.A.A. New Zealand service will be in scheduled operation before the end of this year. The service will follow the Honolulu, Kingman Reef and Pago-Pago route, which is being used on the survey flights. Whether the big Boeing boats will be ready to take over this and the Atlantic service early next year remains to be seen.

Another Atlantic Week

ON August 27 *Cambria* left Foynes on another daylight Atlantic crossing—her third passage in all—under the command of Capt. Powell. She set up a record for the east-west run by covering the distance in 14 hr. 24 min., and breaking *Caledonia's* fastest trip by threequarters of an hour. A few days later, while on a goodwill tour in Canada, one of her outboard floats was damaged, apparently by a floating log, near Toronto. Her return flight, which was due to start on September 8, has necessarily had to be delayed.

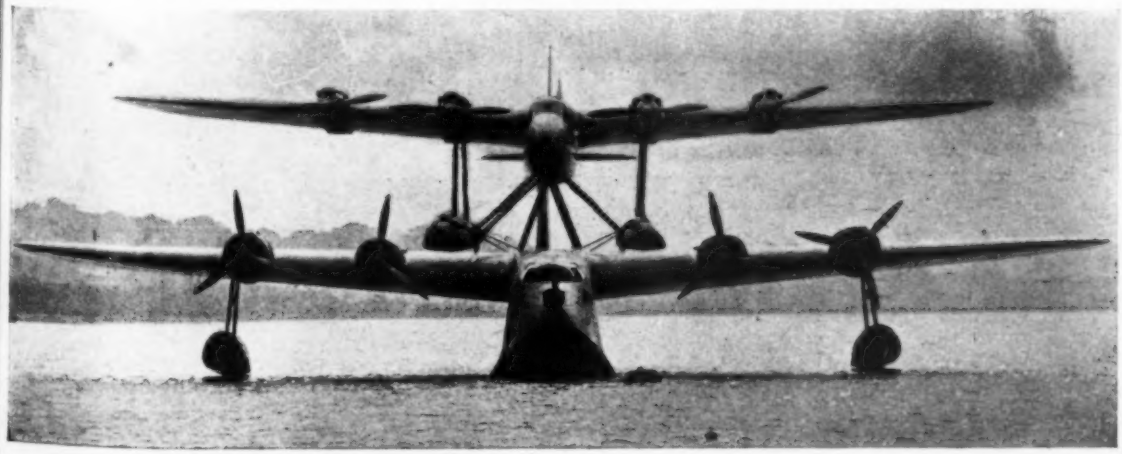
Meanwhile *Caledonia* has completed her coastal tour. She arrived at Hull on August 31, flew up the coast to Edinburgh, across to Glasgow, and down the west coast to Pembroke Dock on September 1. On the following day bad weather in some of the western areas forced her commander, Capt. Wilcockson, to cut out the flying visits to Cardiff, Bristol and various other places on the way back to Southampton.

Leaving Travemunde for Lisbon on August 24, the D.L.H. Blohm and Voss seaplane *Nordwind* made the crossing to the Azores two days later and arrived at Port Washington, New York, on August 30. This is the second of this season's experimental flights by D.L.H.; the first was made by *Nordmeer*, the machine's sister ship, which reached Horta from Port Washington on August 31.

During the same period *Clipper III* made her third flight over the southern route, arriving at Southampton from Marseilles on August 25. The untiring Capt. Gray was in charge.

Now that the dispute about the Atlantic crew of the Latécoère flying boat *Paris* has been settled in favour of the civilians, the French Air Ministry will have little difficulty in making up the crew from the experienced South Atlantic pilots.

An analysis recently made shows that Rouchon (63 crossings in all) and Guillaumet (56 crossings) have each made 26 by flying boat. Feru (10 crossings) has made six, Kersual (18) five, Legall (8) four, and Delaunay (26) three. This list does not include Air France's chief pilot, Codos.



EIGHT-ENGINED BIPLANE: This composite picture of the Short-Mayo gives an excellent idea of the relative sizes of the two components and of the appearance of the assembly as a whole before it is amœbically split into two. *Mercury*, the upper component, made flying trials early this week.

THE INDUSTRY

Steel Research

A HANDSOMELY bound book, recently published, deals with the work of Firth-Brown research laboratories in Princess Street, Sheffield. These laboratories, which were founded in 1908, assist the activities of the four associated steel companies, John Brown and Co., Ltd., Thos. Firth and John Brown, Ltd., Firth-Vickers Stainless Steel, Ltd., and Firth-Derihon Stampings, Ltd.

Hot and Cold

A BOOKLET recently issued deals with the application of Tropal, a special kapok prepared by Airpak, Ltd., of Norway House, 21, Cockspur Street, London, S.W.1. Tropal is said to be lighter than cotton and warmer than fur and handles like cotton felt. The product is of particular use in aircraft for warmth—rugs, clothing, linings, etc., conversely for refrigeration, and, thirdly, for sound insulation.

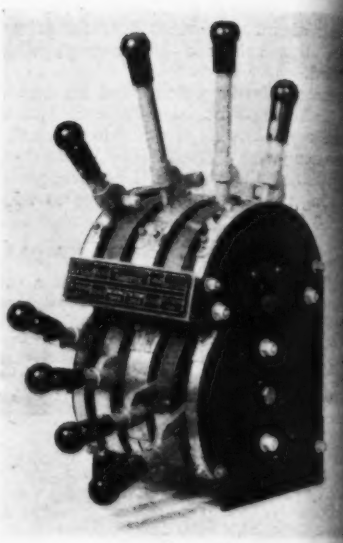
The Industry in India

SOME four years ago the firm of R. K. Dundas, Ltd., was formed with the principal object of acting as agent in India for the manufacturers of aircraft and complementary trades. During this period, though little has been heard of them over here, the good work has gone on—they have sold, for instance, four Vega Gulls in the past year or so—and this concern's latest scheme is the production of a very complete catalogue in which all possible materials and parts are listed with their actual inclusive price at which they can be purchased in India. Any manufacturers whose products might usefully be listed should get into touch with the company at Beatrice Road, Portsmouth. The Indian centre is at the Civil Aerodrome, New Delhi.

In Another Sphere

A NUMBER of firms well known in the aircraft industry will be exhibiting at the Engineering and Marine Exhibition at Olympia from September 16 to October 2.

Among others, the British Aluminium Company will display various sides of its activities; the British Oxygen Company, Ltd., in the welding section, will emphasise improved techniques, together with demonstrations of the latest B.O.C. metal-spraying process; the Mond Nickel Company, Ltd., will feature nickel-aluminium magnet steels, demonstrating them by an ingenious model of an aeroplane floating in a field generated by a magnet of this type; Murex Welding Processes, Ltd., will feature the welding technique in which they specialise; and the Sperry Gyroscope Co., Ltd., will display the many applications of their equipment to marine uses—in which respect, of course, they are, if possible, even more famous than in the air.



EIGHT IN HAND: The Bloctube engine control unit as fitted to the Handley Page Harrow. It provides throttle, mixture, D. H. airscrew-pitch, air intake and oil-cooler control for each of the two Bristol Pegasus engines (with Hobson carburettors). The makers are R.T. Bloctube Controls, Cricklewood Broadway Works, 25, Sheldon Road, London, N.W.2.

NEW COMPANIES

In the notes below, for reasons of space, the "objects" of new companies are usually somewhat abbreviated.

S.M.A. CORPORATION, LTD., registered as a private company on August 18 with a nominal capital of £100 in 100 shares of £1 each. Objects: To manufacture and deal in aircraft of all kinds, engines and accessories, motor boats, cars and other vehicles, etc. The first directors are to be appointed by the subscribers. Solicitors: McKenna and Co., 31/34, Basinghall Street, London, E.C.2.

POWERED MOUNTINGS, LTD., registered as a private company on August 18 with a nominal capital of £40,000 in 40,000 shares of £1 each. The objects are to carry on the business of manufacturers of and dealers in armaments, accessories, components, equipment, machinery and apparatus, including aircraft, engines, guns, rifles, explosives and projectiles, manufacturers of and dealers in transformers, radiators, dynamos, motors and electrical power and transmission plant, etc. The directors are: Esmonde Grattan Thompson, Rangeworthy Court, near Bristol, engineer; Archibald G. Frazer-Nash, 84, Kingston Hill, Surrey, engineer.

AERO-SURVEY DEVELOPMENT CO., LTD.—Private company, registered August 7. Capital, £10,000 in 10,000 shares of £1 each. Objects: To carry on the business of an investment and holding company, and the business of surveyors, traders, carriers by air and otherwise, company promoters, etc. The directors are: James Horsfall (director of H. Hemming and Partners, Ltd.); Humphrey C. Willis; Arthur W. Simon (director of Aerofilms (Holdings), Ltd). Registered office: 22, Queen Ann's Gate, London, S.W.1.

AERO TOOLS AND EQUIPMENT, LTD.—Private company, registered August 16. Capital, £100 in 100 ordinary shares of £1 each. Objects: To carry on business as ironmasters, ironfounders and workers, steel makers, manufacturers of and dealers in tools and equipment, etc. The first directors are to be appointed by the subscribers. Solicitors: Howard Palmer and Co., 115/117, Colmore Row, Birmingham.

SCOTTISH AIRWAYS, LTD., was registered as a private company on August 12 in Edinburgh with a nominal capital of £100 in 100 ordinary shares of £1. The objects are to establish, maintain and operate lines of aerial conveyance, etc. The subscribers are Geo. Nicholson, The Red House, Milliken Park, Renfrewshire (managing director of Northern and Scottish Airways, Ltd.), and C. Fraser, 302, Buchanan Street, Glasgow, solicitor.

ARIC, LTD.—Private company, registered August 14. Capital, £12,000 in 10,000 6 per cent. preference shares of £1 each and 40,000 ordinary shares of 1/- each. Objects: To carry on the business of manufacturers of and dealers in gauges, valves, indicators, instruments and tools of all kinds, engines and motors; aviation, automobile, marine and radio engineers, etc. The directors are Roderic N. Reid and Hugh Bulstrode. Solicitors: Walbrook and Hosken, 4, St. Paul's Churchyard, E.C.4.

CROUCH-BOLAS LTD. Private company, registered August 31. Capital, £1,000 in 1,000 shares of £1 each. Objects: To promote and encourage improvements in or relating to aircraft or to gear or accessories for aircraft, and to take out patents therefor, etc. The directors are: Sir Alan J. Cobham and Rupert J. G. Crouch. Registered office: Lombard House, 16/17, Little Britain, London, E.C.1.

CORDS PISTON RING COMPANY LTD. Private company, registered August 26. Capital £1,000 in 1,000 shares of £1 each. Objects: To carry on the business of iron founders, mechanical engineers, manufacturers of all kinds of machinery, etc. The first directors are not named. Solicitors: Linklaters and Paines, 2, Bond Court, Walbrook, London, E.C.4.

COMPASWIFT LTD. Private company registered August 30. Capital, £[illegible] in 100 shares of £1 each. Objects: To carry on business as distributors, designers, testers and manufacturers of and dealers in aircraft of every description. The first directors are not named. Solicitors: Esmond R. Roney, 42, New Broad St., London, E.C.

PUBLICATIONS RECEIVED

The Brown-Firth Research Laboratories: Princess Street, Sheffield.

Sailplanes: Their Design, Construction and Pilotage, by C. H. Latimer Needham. 6s., Chapman and Hall Ltd., 11, Henrietta Street, London, W.C.2.

Grundlagen der Flugzeugnavigation, by Prof. Werner Immler, Verlag von R. Oldenbourg, Munchen, Germany.

Official History of the War: The War in the Air, by H. A. Jones, Vol. VI and Appendices, 25s. the two volumes. Oxford University Press, Amen House, Warwick Square, London, E.C.4.

Air Navigation: British Empire Edition, by Lt. Comdr. P. V. H. Weems. 30s. McGraw-Hill Publishing Co., Ltd., Aldwych House, London, W.C.2.

The "Don" Road Map Book: The Road to the West, the East, the South, the North. 1s. Small and Parkes Ltd., Hendham Vale Works, Manchester, or from any garage.

Foreign Air Regulations Handbook, No. 16: Italy. 1s. Air Ministry, Adastral House, Kingsway, London, W.C.2.

Aeronautical Research Committee Reports and Memoranda: No. 1735: Wind Tunnel Tests on Slotted Flaps on a Low Wing Monoplane; Flap Angle 0 deg. to 90 deg., by D. L. Ellis, B.Sc., A.R.T.C., and M. B. Morgan, B.A., 2s. No. 1749: The Strength of Lugs, by Wm. D. Douglas, F.R.C.Sc.I., F.R.Ae.S., A.M.I.E.E., 3d. No. 1755: Notes on Stubs for Seaplanes, by L. P. Coombes, B.Sc., and D. W. Bottle, B.Sc., 5s. No. 1756: The Distribution of Stress in Monocoque Wings, by H. F. Winny, Ph.D., 2s. No. 1757: A General Method of Calculating the Effect of Axial Constraint on Torsion on Different Forms of Two-spar Skin-covered Wings, by A. E. Russell, B.Sc., A.F.R.Ae.S., 2s. 6d. No. 1762: The R.A.E. Mark V Torsiograph, by The Staff of the Engine Experimental Department, R.A.E., 2s. 6d. No. 1763: A Note on Roughness, by S. Goldstein, M.A., Ph.D., 6d. No. 1768: Some Experiments with Cascades of Aerofoils, by A. R. Collar, B.A., B.Sc., 1s. 3d. No. 1772: Tests of R.A.F. 34 at Negative Incidences and of the Effect of Surface Roughness on R.A.F. 34 with Split Flap in the Compressed Air Tunnel, by D. B. Williams, B.Sc., A.F.R.Ae.S., and A. F. Brown, B.Sc.

AERONAUTICAL PATENT SPECIFICATIONS

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

(*Published September 2, 1937.*)

2894. SPERRY GYROSCOPE CO., LTD., and HARDING, W. G.: Step-by-step electrical transmitters (470,001).

3346. STIEGER, H. J.: Aeroplanes (469,904).

3538. BRISTOL AEROPLANE CO., LTD., and FRISE, L. G.: Hoods for aircraft cockpits or cabins (469,960).

3627. ELLIOTT, A. G., and BARRINGTON, T. B.: Variable pitch airscrews (469,774).

25840. JUNKERS FLUGZEUG-UND-MOTORENWERKE AKT.-GES.: Devices for damping oscillations set up in structural members (469,864).

34951. HOFFMANN MANUFACTURING CO., LTD.: Bearings for variable-pitch propellers (470,059).

(*Published September 9, 1937.*)

3040. BRUYNE, N. A. DE, and DE HAVILLAND AIRCRAFT CO., LTD.: Manufacture of material and articles from resinous substances (470,331).

4146. GUGLIELMETTI, A., and STIPA, L.: Silencer for the discharge of internal-combustion engines and particularly those of aircraft (470,460).

4322. NORRIS, C. F.: Parachute harness (470,105).

6316. WOODWARD GOVERNOR CO.: Automatic governor control for controllable-pitch propeller (470,284).

12548. SMITH AND SONS (MOTOR ACCESSORIES), LTD., S., and RUSSELL, V. J. S.: Electrical means for indicating relative movements of parts of aircraft (470,200).

20111. ASKANIA WERKE AKT.-GES. VORM. CENTRALWERKSTATT DESSAU UND C. BAMBERG-FRIEDENAU: Gyroscopic apparatus (470,311).

34105. GABA, A. E.: Apparatus for varying the pitch of an aircraft propeller during flight (470,226).